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F. R. Fosberg

Collection Number Book
#10

No. 20614-21392

Aug. 5 - Dec. 5, 1943

Colombia

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Pages

COLOMBIA

| | | |
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| | Marino, Morasurco Ridge, n.e. of Pasto, Cliffs n. of Rio Bobo, Bridge across Rio Guaitará, at confluence of Rio Bobo, Rio Guabo, Piedrancha, Rio Guabo, Curcuele area, above San Miguel,..... | 100-111 |
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Collection and Field Note Book

No. 10

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| Paramo de Sumapaz, hills above Laguna Larga, near Laguna Negra, Quebrada Honda n. of Nevado de Sumapaz, Cund., near crest of Alta San Juan, near Headwaters of Rio San Juan, top of Alto San Juan, | 20651-20792 |
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COLOMBIA

Marino, Morasurco Ridge, n.e. of Pasto, Cliffs n. of Rio Bobo, Bridge across Rio Guaitará, at confluence of Rio Bobo, Rio Guabo, Piedrancha, Rio Guabo, Curcuele area, above San Miguel,

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Collection and Field Note Book

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bet. Rio Piedras and Rio Quilcasé, n.e. of
Dolores, Cauca, s.e. Popayán w. side of valley
of Rio Guachicón 21032-21041



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✓ Aug. 5 - ~~small~~ small ravine
south of Rio Corales, Pasca,
Cundinamarca - 7000 ft.
brushy ravine in pasture.
20614 *Desmodium*
in brush in ravine

4 15 *Lassia*
in brush in ravine
16 *Piper*
in brush in ravine

5 17 *Ambrosia*
edge of pasture
4 18

2 19 *Galium hypocarpium*
edge of brush

2 20 *Castilleja*
edge of pasture

2 21 *Croton*
edge of pasture
4 22 *Castilleja*
in brush

23 *Begonia*

tall herb, 3 m. tall, growing
up through bushes,
stems clinging to clothes
when touched, fls. ^{magenta} purple
straggling bushy tree
about 6 m. tall, fls. white.
shrub 3 m. tall.

perennial forming low
thicket-like clumps.
shrub about 3 m. tall,
branches somewhat drooping,
fls. white.

wine-like, elongate, climbing
through brush, fruits orange,
fleshy.

erect, glistening white-hairy,
distal parts of bracts red,
calyx green.

spreading herb, probably
annual, fls. yellow.

weak shrub 1.5 m. tall,
tips of upper bracts red, distal
half of calyx red, corolla
green above, with lower
edge orange yellow.

shrub 3 m. tall, leaves
glaucous beneath, fls.
rose color, not sticky

- 20624 *Polygala*
edge of pasture
- 25 *Vaccinium*
~~edge of pasture~~
- 26 *Mimosa*
- 27 *V. ...*
- 28 *Ranunculus*
edge of pasture
- 29 *Tournefortia*
- 30
edge of brush
- 31 *Alchemilla*
slope in pasture
- 32 *Trifolium*
pasture
- 33
in edge of Rubus thicket in pasture
- 34 *Blechnum*
in Rubus thicket in pasture, rocky place
- 35 *Daucus*
in thicket in pasture
- 36 *Quercus*
along river
- 37 *Quercus*
along river
- 38 *Salix*
bottom of ravine

- fls. purple, roots with
wintergreen odor.
- small bushy tree, corolla
coral with green lobes and
cripsis, fruit immature
vine, extensively twining
through bushes and trees.
- shrub, fruits green
plants spreading from
root crown, fls. yellow,
fruits green.
- shrub 2.5 m. tall, fls.
white.
- elongate, fls. white.
- fls. greenish white
- fls. yellow.

leaves rather stiff.

tree 10 m. tall, 3 dm. thick.

tree 15 m. tall, 10 dm. thick,
trunk gnarled.
rounded-topped tree, 10 m. tall,
branches with weeping-habit.

✓ Aug. 5 - trail just above Pasca.

Rio Corrales, Cundinamarca 7500 ft.

old stone wall along trail, limestone region.

20639

Muehlenbeckia

clambering through thicket, common

40

Peperomia

crevices in stone wall, common.

41 *Polypodium*

crevices in stone wall, common

42 *Asplenium*

crevices in stone wall, common

✓ Aug. 7 - trail from Pasca to

La Constancia, Cund., up the

Rio Corrales to the fork of the Rio

Juan Viejo, up the left bank

of this to where it comes down

through a great water-gap;

conspicuous for miles down

the valley. Just above the

water-gap, at an altitude of

about 3200 m. is La Constancia,

which is nothing much more

than a large house.

Up the valley from Pasca

the broad valley is cleared

completely except for strings

of vegetation along watercourses

and the upper portions of

the side ridges, which are

still forested.

The willows in this region all have a weeping habit. They are scattered in the ravines ~~about~~ ^{around the} town.

vine climbing in bushes and small trees.

sterile branches erect with abundant very fleshy leaves, fertile branches ascending.

with sparse, thin leaves.

rhizomes extensively creeping.

leaves thick, coriaceous.

leaves thin - coriaceous.

Just below the water gap the trail enters forest. The gap is well wooded with a bushy type of forest which seems to contain a great variety of species. The walls of the gap are tremendous vertical cliffs, almost bare of vegetation.

Above La Constancia what is visible is mostly pasture. *Eucalyptus globulus* is planted here, as is also *Cupressus prob. benthamii*. This latter is said to be native in the region, but all I have seen looks as though it may have been planted. It varies considerably in habit.

- 20047 *Lepidium*
in heavily grazed pasture
- 44 *Veronica*
in heavily grazed pasture
- 45 *Acaena*
edge of cliff, low brush
- 46 *Hypericum brachy*
edge of cliff in low brush
- 47 *Hypericum*
edge of cliff in low brush

Aug. 7 - top of ridge between Rio
Juan Viejo and Quebrada Atadero,
near head of this ridge, about
14 km. s.e. of Pasca, Cundinamarca
paramo ridge, wet ground 9500 ft.

48

growing in tussocks of *Hedyotis*

49

Hedyotis

50 *Hedyotis*

Aug. 7, - Hills above Laguna Larga,
headwaters (probably) of Rio Negro,
25 km. e. of San Bernardo, Cund.
Open paramo, springy
and seeping with water.

51

abundant

- from ~~the~~ gnarled woody
rootstock
reclining, fls. pale blue
- shrub
forming low rounded
mounds.
- shrub 0.5 m. tall, flowers
yellow. "chite"
- low shrub, flowers yellow.

forming compact tussocks
mat. like, spreading by
creeping over ground; flowers
white to purplish.

depressed shrub, growing
taller in sheltered places,
observed from 10000 ft. alt.
on up.

An extensive paramo, with
at least 2 species of
Copelitia very abundant, a
rounded, privet-like ^{woody} shrub
quite abundant.

forming dense, stiff tufts,
inflorescences not abundant, purple.

- 20452 *Alchemilla*
common among hummocks, with 20452
- 53
common among hummocks, with 20453
- 54 *Paepalanthus*
common, in wet spots.
~~forming small cushions~~
- 55
not common
- 56 *Bartschia*
common
- 57 *Eryngium humile*
not common, in very wet spots
- 58
very rare, only two plants seen, in mud.
- 59 *Hedyotis*
common, covering hummocks
- 60 *Elaphoglossum*
not common, on top of hummocks.

Aug. 3 - near Laguna Negra, just below Laguna Larga, headwaters of (probably) Rio ~~Grande~~, 25 km. s. of San Bernardo, Cund.

A small finca, raising chiefly potatoes in a more or less sheltered place among great rocky hills.

- 61 *Blechnum*
rocky ledge.
- 62 *Peperomia*
rocky ledge, sheltered by *Blechnum*

spreading, stiff, green.

spreading, soft, gray.

fls. white.

forming small cushions
erect

erect, purple, fls. and bracts purple.

involucre stiff, greenish-black outside, white within, fls. whitish.
fls. bright blue. ^{head} level with ground, cup shaped with edges flaring
forming a thick mat, rooting at nodes, leaves in 4 ranks, fls. white to purplish.
bracts erect, infolded so as to be cymbiform.

This is agriculture reduced to its lowest and most difficult terms. Potatoes, a few onions, and a cow.

The vegetation is pure paramo. *Escholtzia*, *Castilleja*, *Hypericum*, a few other small shrubs + many tufted herbs.

Rhizome short, erect, not evident above ground, fertile fronds erect, sterile ascending. leaves fleshy.

Lupinus

growing near garden but said to be native

Helianthus

growing on thatched roof of house.

Aug. 8 - Quebrada Honda, one of headwaters of Quebrada Cabrera, 10 km. north of Nevado de Sumapaz, Cund. 10000 ft.
small grassy flat along stream in páramo, wet ground.

Geranium

scattered in matlike vegetation

forming a thick mat

Valeriana

scattered clumps

Halenia

pair sized colony near stream

Halenia

scattered plants with # 20667.

Senecio

common

Hypericum

common

scattered small colonies

erect suffrutescent herb
1 m. tall, infl. erect, flowers
magenta-purple with central
part of banner yellow.
large rounded clump.
intricately branched, petals
white, split.

fls. white

fls. white

from a thick woody root,
fls. white, infl. ~~reddish~~
plant and fls. pale green.
plants in small clumps.
petals white, plants caespitose.

erect clumps, involucre
maroon, rays bright purple,
disk reddish brown, heads
nodding.

erect shrub, 1 m. tall, involucre
yellow, fls. whitish.

erect, forming small clumps,
fls. yellow.

low spreading clumps, fls. yellow.

erect, ~~to~~ caespitose, heads nodding.

20675

Hypoleucum

abundant throughout region

20676

Comp.

scattered near stream

Aug. 3 - ^{near} Crest of Alto San Juan, in a small pass about 10 km. n. of Nevado de Sumapaz, west of Quebrada Rabona open páramo slope, with 4000 m. abundant *Espelletia*.

20677

Espelletia

abundant, growing with #20679 with no apparent intergradation

infl. axillary spreading

20678

Chusquea

abundant over whole region

20679

Espelletia

abundant over whole region, here partially giving place to #20677, not intergrading.

Aug. 3 - west of Cuchillo Andabobo lies Laguna Andabobo, a group of small marshy lakes. The vegetation here merits a much closer

erect shrub 2 m. tall, twigs

erect, fls. yellow

erect shrub 1 m. tall, gray.

rosette on top of stem about 6 cm. thick, covered with old leaf bases, making the whole about 15 cm. thick, about 1.5 m. tall, heads nodding, rays yellow. erect, about 0.8 m. tall here, in more sheltered places much larger, forming small brakes several m. tall, some but not all plants in flower. rosette on top of stem about 6 cm. thick, covered with old leaf bases, appearing about 15 cm. thick. stem of this plant about 1 m. tall, others up to 2 or 2.5 m., infls. spreading, golden-yellow, heads nodding, fls. yellow.

study than is possible riding by on a mule. Seems to be a good development of aquatic and marsh plants.

near headwaters of Rio San Juan
 Aug. 9 - ~~Valley of G. Rabana~~, high
 on ~~eastern slope~~ of Alto San Juan
 9 km. north of Nevado de Sumapaz,
 a small cirque-like valley, 4000 m.
 with a tiny woods of a ^{few} trees
 Serecis up to 6 m. tall. The páramo
 has been burned over relatively recently.

- 20630 *Urtica*
 under Serecis trees, abundant
 but mostly sterile
- 81
 abundant under trees
- 82
 on ~~the~~ mossy banks, common
- 83 *Vaccinium*
 on mossy banks and ledges, common
- 84 *Ribes*
 common on ravine sides
- 85 *Gentiana*
 very rare, ^{few} plants found on eroded
~~the~~ ridges.
- 86 *Cardamine*
 wet ravine bottom
- 87 *Epilobium*
 wet ravine side, in clump of
 other plants
- 88 *Erigeron*
 exposed ledges
- 89 *Baccharis*
 exposed ledges and eroded ridges,
 with # 20640

woods surrounded by
 open páramo. Small rivulets
 descending through the
 woods, ground covered
 with low plants, mostly
 mat-formers or rosettes, and
 mosses.

weakly ascending,
 strongly stinging

loose tufts, infl.
 drooping.
 mat-forming, brittle
 fls. greenish-white.

erect ~~or~~ ascending
 shrub, up to 1 m. tall, fls.
 dull purplish red, fruit
 reddish-green, not quite ripe.
 fls. dull purple.

weak, prostrate to ascending,
 fls. white.
 fls. deep magenta,
 plant reddish.

fls. white with purplish
 tinge, plant caespitose, gray.
 prostrate, buds purple,
 fls. whitish. ♂

- 20690 *Baccharis*
exposed eroded ridges & ledges, with #20689.
- 20691 *Baccharis*
exposed ridge, with #20692
- 92 *Baccharis*
exposed ridge, with #20691
- 93
exposed ridge
- 94 *Epilobium*
steep slope at foot of cliff, in
clump of other plants.
- 95 *Bromus*
in woods on slope at foot of cliff.
- 96 *Hydrocotyle*
wooded base of cliff
- 97 *Stellaria*
ledge on cliff
- 98
cliff and slope at foot of cliff, abundant
- 99
ledges on cliff, common
- 20700 *Senecio*
dominant and only tree in woods.
- 01
on cliff, ~~at~~ common, forming
clumps, mostly out of reach
- 02 *Polystichum*
common on slope at base of cliff.
- 03
occasional in woods

- prostrate, buds green, fls. white
- ♀
shrub 1 m. tall, erect, ♀
fls. white
- shrub 1 m. tall, erect, fls.
white. ♂.
- mat-like, fls. pinkish,
fruit red, likely immature.
plant scarcely reddish,
calyx dark red, corolla white.
- creeping
- forming a loose mat,
flowers white.
- reclining herb 1 m. long or
less, ~~erect~~, ascending at
tips, gray, involucre maroon,
rays bright purple; disk red-
brown.
- decumbent at base, a coarse
herb, fls. yellowish brown.
- ~~gray~~ gnarled tree up to 6 m. tall,
fls. yellow, only occasional
branches in flower.
- herbage glaucous, fls.
bright lemon yellow.
- Rhizomes branched, forming
hummocks, fronds strictly erect.
erect shrub 2 m. tall,
fruit black.

20704

Castilleja

abundant on slope at base of cliff

05 Lupinus

abundant on slope at base of cliff

06

growing in very dense vegetation on cliff.

07 Cynoglossum

common in region, especially in wetter places.

08 Acaena

common on exposed ledges and slopes

09 Jamesonia

occasional on ledges and other exposed places

10 Lysyrrhynchium

rare on ledges

11 Bartsia

common in exposed places

12 Carex

common, especially in depressions

13

common on mossy exposed ledges and banks

14 Oenothera

common on mossy banks and violet margins.

15

occasional on exposed mossy banks.
(possibly depauperate form of #20706.)

16 Alchemilla

very abundant in exposed places

spreading stems suffrutescent at base, branches erect, calyx red distally, corolla green with lower edge orange.

herb forming large decumbent masses, fls. violet.

fls. lavender.

caespitose, lower leaves decaying into a gelatinous mass, fls. from pale blue to white.

rosettes flat to ground, scapes ascending.

rhizome deeply buried, fronds strictly erect.

erect, fls. yellow.

bracts and flowers purple.

deep based, loose spreading tufts, culms ascending.

rosettes tight to ground, loosely caespitose, heads yellow.

prostrate, fls. yellow, closed in morning.

fls. lavender.

~~is~~ very prostrate.

22

1943 - Colombia

20717

Nertera granadensis

moxy banks

1 18

Laguna

moxy banks

1 19

moxy banks

2 20

Lerema ~~*gracile*~~common in ~~open~~ open places

2 21

Rumex tolimensis Wedd.

common in wet places

det.
R.C.F.

22

common in rivulets and oozy places
with # 20724, no intergrades.

23

Cardamine

in rivulet

24

~~*Cardamine*~~common in rivulets and oozy places
with # 20722, no intergrades.flat turfey moxy place about
4 m. across at head of valley, appearing
to be a filled in pool, very wet,
with rivulet on one side.

4 25

Junca ~~*sp.*~~

banks above pool

3 26

Junca ~~*sp.*~~

2 27

Junca ~~*sp.*~~

3 28

Junca ~~*sp.*~~

Paramo de Sumapaz

23

very prostrate, fls. greenish.

prostrate, fls. white.

fls. white

~~the~~ involucre purple,

fls. yellowish.

- giant plant up to 2 m. tall,
the leaves dead at base
of fruiting & flowering plants,
other sprouts with leaves
and huge coriaceous terminal
bud with great quantities
of mucilage, areas transparent
and filmlike.- fls. white or pale pink,
closed in morning, open
about noon, ~~in~~

fls. white

fls. purple, closed in
morning, open about noon.

forming a dense prickly turf.

- spikes erect, sticking out of moss.
fls. white.

20729

Ranunculus

2 30

Geranium

1 31

Ranunculus

in wettest part

3 32

dominant plant in part of pool

2 33

1 34

rare,

2 35

rare

1 36

Isotria medeoloides A. Braun det. H.P. Fuchs 1960
only one plant found

2 37

*Cardamine*in a slightly raised, grassy
part of turf

Aug. 10 - same loc.

a similar boggy spot, but
somewhat older, more hummocky.
(a few plants from here included
with yesterday's when they seemed
obviously the same.)

1 38

Epilobium

in deep moss-turf

4 39

*Ranunculus*in shallow water forming a
dense growth.

1 40

Lygula

on hummock

2 41

Geranium

common in deep moss turf

heads whitish, button-like.

fls. white.

fls. yellow.

forming dense ~~area~~ turf.

fls. white.

erect

tops of quills well below
surface of turf making
a small depression.

prostrate; fls. white.

fls. white.

fls. pink

20742

in deep moss turf

wet ravine bed covered
with deep moss and
grassy hummocks

43

on hummock

44

Castilleja

in deep moss and grass

45

on hummock

46

on deep wet moss

47

Bromus

on hummock

48

Carex

on hummocks, common

49

on hummocks

50

on hummock

cliff and slope at base,
with wet ravine at bottom.

51

*Fuzula*abundant on cliff on tiny
ledges and in crevices.

52

wet ~~the~~ bottom of ravine, not

53

Agave

wet bottom of ravine, not shaded.

fls. blue

stiff large clump.

erect, bracts ~~and~~ scarlet
distally, calyx green, corolla
green but apparently not
exserted.

infl. dark purple.

prostrate, fls. white.

infl. drooping, purple

deep rooted, small ~~clumps~~
plants with few culms.
infl. stiffly erect.

infl. drooping

tufts

odor strongly like calery
- fls. white.
forming round, hard, but
more or less hollow hummocks.

20754

Lepidochloa

in crevices in Azuella(?) hummock

255

Deschampsia

mixed in Azuella(?) hummock

356

Paspalum

slope at foot of cliff, one of the dominant plants on steep slopes and wet places.

357

Escallonia

edge of dense woods on slope at foot of cliff

exposed slopes and ledges with seeps and rivulets very abundant.

158

Ranunculus

mossy ledge

259

Carex

rare, wetish slope

260

Carex

common, exposed slope

361

Geranium

growing out of a dense mass of overhanging vegetation

362

Polypodium

crevice under overhanging ledge on face of large boulder

363

Alchemilla

high, exposed slope

364

Woodwardia

under edge of great boulder

265

Potentilla

wet slope

deeply trough-shaped.

forming large stiff clumps.

stiff spiny rounded shrub 2 m. tall, fls. white, calyx and ovary dark red.

fls. yellow.

erect with slightly decumbent base, rays pale yellow, disk greenish yellow.

erect with a long decumbent base, herb, involucre maroon, rays bright purple, disk yellow. fls. pink.

fronds hanging down, rhizome glaucous.

low, somewhat protected by bushes.

prostrate, spreading, fls. yellow.

- 20766 *Haleisia*
in deep ~~moss~~ wet moss turf
on wet slope.
- 67 *Alchemilla*
exposed slope
- 68 *Comp.*
exposed bare slope, ~~to~~ tightly
matted cushion vegetation
- 69 *Galium*
in large clump of grass on
exposed slope.
- 70 *Asplenium*
exposed slope
- 71 *Asplenium*
crevice in boulder in ravine
- 72 *Asplenium*
exposed slope, rare
- 73 *Asplenium*
under edge of boulder in ravine
- 74 *Draba*
abundant in moss-turf on
wet slope
- 75 *Comp.*
common on exposed slope in
cushion vegetation
- 76 *Comp.*
sides of ravine and open slope
- 77 *Geranium*
in moss turf on very wet slope
- 78a *Geranium*
~~comp.~~ dominant in patches
of cushion vegetation on exposed slope

fls. ^{pale} green

stiff rounded clump.

stems prostrate, heads
on ~~erect~~ ascending peduncles,
rays bright yellow striped
on back with brown, disk
brownish.

fruits green.

involucre maroon, fls.

pinkish.

erect.

roots fleshy

erect

fls. white

plant glaucous-green, fls. blue

prostrate, peduncles erect.

forming soft hummocks,

fls. white.

fls. pink.

20778

Lupinus

ledge near top of cliff

Aug. 11 - same loc.

79 Carex

common on lower slopes.

80

common in wet places but
only one seen in bloom

81

Carex

scattered in various habitats,
not rare

82

Lupinus

wet slope, large colony,
mostly sterile

83

Graptophyllum

mossy bank

84

Geranium

mossy bank

85

Geranium

mossy bank

86

Senecio

mossy, boggy head of small stream

Aug. 11 - top of ^{alt. San Juan} above last loc.

rocky windswept backbone of mountain

87

Hedyotis

open spaces between bushes and
tufts of grass, also rock crevicesdecumbent woody base
about 7 dm. long, covered
with dead leaves, ^{waxy} branchlets
at point of upturn, fruiting
spike columnar, 3 dm. tall.
(seed sample).spreading clumps, mature
inflorescence drooping
erect, rays pale yellow.

erect

erect, fls. blue-violet
banner with pink center
(same as #20773)forming small cushions, fls. ^{pale} pink
(different from #20735)forming small cushions
(different from #20734)shrubs 1.5 m. tall, fls. pale
yellow

4200 m.

prostrate with erect branchlets,
leaves on these conspicuously
4-ranked, fls. white to pale purple.
Mat thinner, not attached to
ground in exposed places, lower
and deeper when protected

- 20788 *Paepalanthus*
exposed ridge top
- 1 89 *Elaphoglossum*
partly protected rock crevice
- 1 90 *Lycopodium*
protected by clumps of grass
- 3 91 *Senecio*
exposed rocks
- 1 92
among grass clumps, only one seen

Paráms de Sumapaz

Under this general name is included an enormous expanse of high country, from 3000 to 4500 or more meters in altitude, centering around the Nevado de Sumapaz, between the south end of Cundinamarca and Meta. It extends along the Cordillera Oriental for 60 km. from Osera almost to El Hato, with branch ridges extending in all directions. Much of the high country is rolling, with high sharp ridges here and there, and many small lakes in the depressions. Many of the streams that radiate out originate in these lakes. The páramo separates the drainages of

forming dense cushions, fls. white
erect, fronds revolute

stems mostly underground,
leafy branches close to ground,
spikes erect.
erect but somewhat gnarled,
fls. pale yellow.
erect.

the Rio Magdalena and the Rio Orinoco, and the headwaters of the streams are so entwined that it is often difficult to tell which way the water is eventually going. Seeps and rivulets are everywhere.

? meant 3 →

This páramo is burned over every year, so that the grass will produce new tender shoots which are more palatable for livestock. Therefore it is difficult to tell what its original condition was. The destructive effects of Colombian so-called agriculture thus extend even to such forbidding areas as the páramos. A few tiny potato farms are scattered here and there, even

up as high as 3700 m. I have seen practically no stock up here to benefit by such burning. Growth is naturally very slow, so overgrazing is easy. However, I have seen few evidences of it in this páramo.

This description should be regarded as fitting only this particular páramo in its present burned condition. The burning doubtless is the reason why the ~~the~~ cushion plants are mostly small.

The páramo is basically a grassland of principally three kinds of stiff bunch-grass. There all form dense hummock-like bunches, with stiff, harsh, sharp quill-like blades and occasional inflorescences. The bunches are spaced an average 4 or 5 dm. apart.

Another grass, possibly a *Chusquea*, although not climbing, is locally abundant. It too is very stiff, but it forms colonies rather than bunches and its blades are flat and lanceolate. In exposed situations it is low, but erect, 6 or 8 dm. tall

The soil is thick, up to 3 dm., and very black. It is often so saturated with water as to be a soft mud.

when not in fruit. The spikes are several dm. taller. In wetter places it becomes 1 m. or more tall, and in sheltered places it forms small cane-brakes up to 3 or 4 m. deep.

The most characteristic plant of the páramo is *Espelletia* or "~~Fraxil~~" "frailejon". This curious composite genus strangely resembles the silver-sword of Hawaii, but has axillary inflorescences. It is a rosette plant, the large woolly rosettes usually topping a post-like stem, composed of a pith, a woody cylinder, a softer outer cylinder, all about 6-10 cm. thick, surrounded by a coating of persistent leaf and inflorescence bases as thick again. The leaves are ~~lanceolate~~ oblanceolate spatulate or oblong, very densely woolly, and 2-3 dm. long. The inflorescences form a ring, projecting outward or upward somewhat longer than to several times as long as the leaves, and are even more densely woolly. The flower heads are yellow, enveloped

in the white or golden wool of the inflorescence, and are usually nodding. In the Paramo de Sumapaz are at least 4 perfectly distinct species of *Espeletia*, which can be told apart from a considerable distance.

These plants are thickly scattered over practically the whole paramo, from one to several meters apart. They grow to a height of 3 m. at the most, but of course are usually from stemless to one meter. They give a characteristically unearthly aspect to the paramo landscape.

A shrubby *Hypericum* from 0.5 to 2 m. tall is very common in most parts of this paramo. It has bright yellow flowers, much larger than those of the other half dozen species of this genus that abound here.

Shrubby *Compositae* - *Baccharis*, *Senecio*, etc. are locally common. A tree species of *Senecio* with leaves like a *Buddleia*, forms small patches of woods in sheltered valleys. The trees reach a height of 6 m.

Between the bunches of grass the ground is covered

by mosses and various moss-like cushion plants. A mat-forming *Hedyotis* is the most common. At a glance it resembles the *Pyxidanthra* of the New Jersey pine barrens. It begins at about 3500 m. and is still common at 4200 m. Several geraniums, a *Vaccinium*, an *Oenothera*, and one or two *Ericaceae* are very prominent. More rare are several *Compositae*, *Senecio*?, several species of *Hypochaeris*, *Erigeron* etc. A number of species of *Alchemilla* (?) and several *Umbelliferae* are also common. One of the *Alchemilla*, a prostrate one, forms much of the ground cover at high altitudes. A ~~so~~ cushion-forming *Hypericum* is also common. Low hummocks of a tiny *Paspalanthra* (*Eriocaulaceae*) are seen everywhere.

Scattered here and there are several sedges, *Carex* (2 sp.), *Rhynchospora*, etc. and a yellow *Lespedeza* which grows in the grass bunches. From the sub-paramo up to about 3700 m. a stiff, upright species of *Hedyotis*, probably *H. nitida* is very common. It is not seen at the higher altitudes. *Lupinus* of several species is locally

most
yellow flowered
Lespedeza
are common

pin-like in appearance
with small
blue flowers
scattered over the region.
Castilleja is common
and conspicuous.

common. Most of these are quite ordinary-looking, though one has large magenta flowers. One, however, is magnificent. It has a thick stem, often decumbent and quite woody at base, large dark green leaves, the bases with long white hair, and a columnar inflorescence up to 3 dm. tall, resembling, from a distance, one of the Canary Island Echinus. The rachis is about 3 cm. thick, hollow, and bears flowers spirally as close as they can be set on this column. The whole is 6 or 8 cm. thick. The flowers are violet, with a pink wedge on the banner. Linear bracts project beyond the flowers. The fruiting inflorescence, with crowded silvery-silky pods about 2 cm. long, is as spectacular as the flowering one, or more so.

In wet spots, seeps, springy places, ravine bottoms etc., a different flora is found. Usually still present are the bunch grasses. Sedges are more abundant. Moss forms a deep soft wet turf. In this are many

Rumex acetosella
forms red patches
here and there
over the whole
paramo.

Columines of
Purys, the striking
somewhat with
spikes

→
great paramo
common
locally.

curious tiny plants of diverse families - Umbelliferae, Bragiacae, Ranunculaceae, Compositae, and, apparently rarest of all, an Isoetes. This, along with most of the others is found in ~~the~~ small open areas which are evidently filled in pools, tiny bogs but lacking sphagnum. Only one plant of the Isoetes was found by me, completely immersed in the turf, appearing as a depression lined with stiff, thick, sharp grills.

→ A Stellaria (?) with leaves like Salvinia, forms soft hummocks here and there. A striking Castilleja with four-sided spikes and scarlet, imbricate bracts ~~is scarce~~ presents occasional oriental looking finger-like columns. An umbellifer with an odor exactly like celery, but a low rosette plant is common on wet slopes, as is also one of the most curious things of all, an umbellifer (Agrostis sp.?) which forms hard, round hummocks of tiny rosettes, but which is almost hollow inside - filled only with

a white flower
Drosera and
a green flower
Halenia are
common in
springy
places.

loose decayed leaves and radiating stems. Also forming hummocks, but very prickly ones is a tiny junceous plant resembling *Oreobolus*.

Present 4 → Shrubby *Senecios* and other composites, as well as a number of striking looking herbaceous Compositae, one genus with brilliant purple or in one species yellow, ~~radiant~~ ^{radiant} heads, another perhaps the most densely woolly of all plants and with great, nodding heads without rays, are also common in these wet places.

Rock ledges and cliffs have several interesting things - *Luzula*, a great *Draba* 6 dm. tall, a bright yellow *Erythronium* (?), a stiff, spiny *Escallonia*, a woolly *Senecio* with round revolute leaves, and several ferns. A couple of *Aspleniums*, one possibly a form of *A. trichomanes*, a *Woodia* or *Cystopteris*, two *Elaphoglossums*, stiffly erect, a stiff, erect, acaulous *Blechnum*, and the curious *Jamersonia* with its erect delicate, unnatural looking fronds.

lower paramo and

The ^{lower} sub paramo slopes, below the paramo proper, a sort of transition to the forest below, present a curious superficial resemblance to the heath balds of the southern Appalachians. An abundance of Ericaceous shrubs - *Gaultherias*, *Perrettias*, *Vaccinium*, *Thibaudias*, and others not recognized, add to this aspect. However, a great variety of Melastomaceae of all sizes and colors, most of them strikingly beautiful, and the usual shrubby composites, ~~shrubby~~ ^{shrubby} *Hypochaeris*, and *Thuchelaenbeckia*, would be amazing indeed, in a heath bald. *Hedyotis* might be found in both, or at least near a heath bald, but the delicate *H. procumbens* ~~is~~ bears little vegetative resemblance to the shrubby *H. nitida*.

This vegetation, greatly extended by destruction of the forests, is one of the most colorful in the tropics. There is always a riot of flowers in bloom.

The paramo region as a whole is a gigantic flower garden, or rather, rock garden. It is to be hoped that some of it may be spared for the future botanists and plant lovers to see.

Insert

Eryngium acanthe, a queer little rosette plant, is quite common here as in other páramos. Its heads of bluish-white flowers with white bracts are quite distinctive. More rare is a large prickly species of the same genus which at first sight would surely be mistaken for a bromeliad.

The term "páramo" means little to the average reader. To the average Colombian it simply means a cold, inhospitable wind- and rain-swept high region. Botanists have attempted to use the term with various limitations. In line with ~~my~~ ^{the} idea of using popular terms in ecology to represent as nearly as possible what they mean to the people to whom they are a part of the language, I would suggest using the terms "páramo" and "sub-páramo" to designate that part of the northern Andes which lies above the limit of forest proper and below the line of perpetual snow. This would correspond, roughly, with what the Colombian

means by the term "páramo". However, no two Colombians seem to have exactly the same idea of it.

The division into "páramo" and "subparamo" zones, to correspond, roughly, with the ~~lower~~ upper, predominantly herbaceous vegetation belt and the lower, predominantly shrubby belt seems justifiable on purely vegetational grounds. Of course, there is no fixed boundary between these, just as there is no clear boundary between sub-páramo and forest. Clearing, overgrazing, fire, and other destructive agents have apparently greatly extended downward the subparamo from its original 10000 to 11500 ft. ~~lower~~ limit. This is probably due to the fact that páramo and subparamo are early, though usually arrested, stages in a succession in such a wet climate as prevails in high Colombia.

In any event, whether the terms have any true geobotan- (old. p. 52)

Aug. 12 - Rio San Juan, at Cerro Los Amarillos, where the river comes out of the Alto San Juan, Cundinamarca páramo slope near river.

20793

Miconia

sheltered places where it is not

94

Eryngium paniculatum

seen occasionally in the páramo but common here

Aug. 12 - Rio San Juan, just above San Juan.

Cundinamarca

páramo slope high above river 11800 ft.

95

Espeletia

96

Spiranthes

between grass clumps

97

Fuchsia

in clump of bushes in a tiny sheltered depression

Aug. 12 - Rio San Juan, near crossing just above San Juan.

Cundinamarca

sub-páramo bush in valley bottom

98

Vaccinium

99

Hedyotis nitida

very common

20800

Pernettya

erect, cypress-like habit,

berries purple.

single or caespitose, heads purplish white.

acaulous rosettes, cymes ascending, rays yellow, disk brown.

erect, flowers white.

~~the~~ erect weak shrub, growing up through other bushes, fls. rose-pink, pendent, fruit spherical, dark red, fleshy.

bush 1 m. tall, berries purple. erect shrub 1 m. tall, fls. white within, purple without. erect shrub 1 m. tall, fls. white. leaves reticulate beneath.

Aug. 13 - Quebrada Las Chóveras (R. Diqueal)
just about 3 km. above its confluence
with Rio Sumapay, 20 km. s. s. e.
of San Bernardo, Cundinamarca
sub-paramo bush on
side of valley.

70901

Calceolaria microbefaria n. sp. *microbefaria*

Aug. 13 ^{top of} ridge between Quebrada
Las Chóveras (R. Diqueal) and Quebrada
Tunal (Rio Gobernador), 20 km.
s. s. e. of San Bernardo, Cund.
Open paramo, no bush,
somewhat grazed.

02 trap

wet ground between grass clumps

03

Espeletia

common over large area

04

Juncus

large scattered colony in wet
places

det. Molau

weak shrub 1-3 m. tall, fls. yellow.
leaves rather glutinous.

fls. blue, heads closing
immediately after gathering.
stem about 3 dm. tall,
others up to 1 m. or, in protected
places, even 1.5 m. tall, ^{bearing} ~~rosette~~
of leaves, mostly ascending,
of varying widths ~~on~~ on different
plants, those on this plant
rather narrow, veins
conspicuous beneath,
inflorescences almost
erect, wool golden on
~~base~~ involucre, fls. yellow.

- Aug. 13 - Quebrada El Tunal (Rio Gobernador) 2 km. above its confluence with Rio Lurmapay, 27 km. s.e. of Pardi, Cundinamarca
 20805 *Gaiadendron*
 sub-paramo bush or low forest.

- Aug. 14 - ridge s. of Quebrada El Tunal (Rio Gobernador), 28 km. s.e. of Pardi, Cundinamarca
 sub-paramo on cut-over forest land
 06 *Castilleja*

- 07 *Galium hypocarpium*
 in clumps of vegetation
 08 *Lobelia tenuis*
 in clumps of vegetation
 09 *Jamesonia*
 lower side of boulder on slope

Aug. 16 - Rio Arroyo

cut over forest, now of a paramo character, in places planted to potatoes, in places grazed.

10

on *Solanum tuberosum*

11

grazed slope

The forest here certainly once extended up to 11500 ft. and possibly to 12000. Largely destroyed now, replaced by sub-paramo bush and paramo. Shrub 3 m. tall, others seen taller. flowers white, petals recurved.

upper bracts and calyxes scarlet, corolla green above, red beneath. climbing in bushes, fruit orange, fleshy. fls. lavender with yellowish center. large clumps, fronds erect.

forming the "potos" disease, said to cut the potato crop in half. older plants rounded, bushy, fls. white, strong oily odor. "apara"

ical, plant-sociological, or phytogeographical significance or not interests me little. They are convenient designations for two types of vegetation with an aspect and floristic composition not duplicated elsewhere in the world or indicated by any other term, and of extraordinary beauty and interest. Of course, corresponding zones of dwarf vegetation exist at high altitudes on various tropical mountains. Geobotanists likely have or will invent a general term to include all of them. Páramo should likely be restricted to regions from Costa Rica southward to Ecuador (or possibly Peru). It is said that the northernmost páramo is that on Irazú(?) in Costa Rica.

Insect 2

In some areas an acaulescent *Blechnum* with erect leathery leaves is one of the common plants, while in one or two sub-páramo localities a rather similar *Blechnum* with a tall trunk and spreading sterile fronds was seen. A shrubby *Senecio* with terete green leaves and yellow flowers is also abundant in some areas.

Insect 3

It must not be imagined that the boundary of the páramo is always at 3000 m. This is the lower limit of possibly natural subpáramo vegetation. In places forest extends up to as much as 3700 m. One slope of a mountain will be densely wooded, while another will be extreme páramo, apparently dependent on the exposure. Patches of páramo exist in depressions completely surrounded by forest. I suspect that temperature is the deciding factor, since páramo vegetation exists in ~~many~~ sheltered places where wind could have little influence.

Insect 4

Perhaps most remarkable of all is a giant Rumex, up to 2 m. tall, spreading by underground rhizomes. As the erect stems form giant inflorescences with leaf-like bracts, the leaves below die and the inflorescence ripens and dies. Meanwhile other shoots are emerging, the leaves very large, with giant, transparent veins, the huge ~~ter~~ conical terminal bud covered by them and secreting great quantities of mucilage.

Aragoa, one of the most curious paramo plants is not common in this region, but at least one species is ~~is~~ found locally.

208, 12

Psittacanthus

common in brush appearing in pasture

13

Gentiana

rare in pasture

14

Rhynchospora

common

15

Hypericum

common in brush appearing in pasture

16

*Vaccinium*common in pasture and
brush above pasture

17

Carex

along rivulet

18

Hypericum

common in less grazed parts of pasture

19

Graptophyllum

weed in pasture, very common

20

Centropogon

common everywhere in region

21

Aptenia

rare in wetland place

22

Graptophyllum

common weed in pasture and potato patch

23

Passiflora

in bushy place on ridge

24

Polypodium

on tree trunk in pasture

25

Mercurialis

common in ravines

26

Senecio

common over whole region

low shrub, corolla urn-shaped,
white, with ~~some~~ red tips to lobes,
fruit black, fleshy.
erect, fls. purple.

small tufts, culms
ascending or erect.
erect, fls. yellow,
leaves 4-ranked.

low shrub, fls. pink,
berries purple.

small clumps, culms
ascending, spikes pendent,
fls. yellow.

small tufts, infl. erect.

icky odor when broken "Apio".

erect.

low spiny shrub, 0.7 m. tall,
fruits immature, said to be
black and edible when mature.
slightly glaucous, esp.

rhizomes.

shrub 2 m. tall, calyx and
hypanthium red, corolla pale yellow,
erect, brittle shrub up to 1 m. tall,
heads yellow. Called "guacquin" and used
for liver ailments but this taken by local
people from a book, really applies to another sp.

leaves
taste fleshy
green

- 20927 *Sisyrinchium*
common
- 28 *Geranium*
very common
- 29 *Lupinus*
common
- 30 *Cynoph*
weed in potato patch
- 31 *Lathyrus*
in bushes and tufts of vegetation
in pasture
- 32 *Equisetum*
common weed in potato patch
- 33 *Halenia*
scattered in pasture
- 34 *Vicia*
in bushes and tufts of vegetation
in pasture.
- 35 *Fuchsia*
in bushy places
- 36 *Rubus*
common in bushy places
- 37 *Rumex acetosella*
weed in potato patch
- 38 *Rumex acetosella*
common in patches everywhere
- 39 *Geranium*
common in pasture
- 40 *Alchemilla*
common in pasture
- 41 *thickets*

- tufts, flowers yellow.
- spreading tufts, fls. pink.
"yerba del dolor".
stems prostrate, spreading
from root, racemes erect,
fls. violet with pink wedge
in banner.
prostrate
- fls. purple.
"albergilla"
- "cola de caballo"
- fls. greenish-white.
- said to cause death of newly
castrated ~~stems~~ if eaten.
- fls. rose-pink, pendent.
- low, spreading canes, glaucous.
fls. rose-pink.
prostrate, fls. pink.
- infl. red. "~~yerba del dolor~~"
"pasta Colorado"
- spreading, prostrate with
ascending infl., fls. pink.
"yerba del dolor"
- valued for pasture, spreading
by runners and holding soil "la plegada"
- shrub 3 m. tall, fls. white. "salvia grande"

20842

Baccharis

common in pasture

1 43

Momina

rare in thickets

1 44

Salvia

pasture

2 45

Tropaeolum

steep slope above river

1 46

Hedyotis nitida

very common everywhere

1 47

Salvia

pasture

1 48

Castilleja

pasture

1 49

Aug. 18 - same loc.

exposed, grazed paramo ridge

1 50

Miconia

grassy slope

1 51

Salvia

common, but not much in flower

1 52

Salvia

very common

1 53

Gaultheria

very common

1 54

Salvia

in small tree in sheltered place.

shrub 1 m. tall.

shrub 2 m. tall, fls. blue.

"cinto"

fls. deep crimson, infl. and

calyx maroon. "salvia"

vine, fls. vermillion with

greenish tip to spur.

~~"cobito"~~ "cobito del indio"

shrub up to 1 m. tall, fls.

white with lobes tipped

outside with purple.

buds purple.

prostrate, calyx purplish.

fls. pale bluish.

suffrutescent herb, calyxes

and upper bracts scarlet

distally, corolla green, with

lower edge yellow distally.

rosettes clustered, hair on

scape dark red, fls. butter-yellow

small bushy shrub 0.5 m. tall,

rays purple.

bracts and flowers dull

coral, roots thick, fleshy.

low dense bush 0.5 m. tall,

but in sheltered places

forming a gnarled tree. like

shrub up to 3 m. tall, trunk 3 dm. thick.

fruits slightly fleshy, purplish-green

fls. fleshy, greenish-yellow, lips

slightly marked with brown

Aug. 19 - Rio Arroyo

A giant species of *Chusquea* is common here, but sterile. The canes resemble sugar cane, and are as much as 4 cm. thick, usually about 2.5 cm. They are used to form the horizontal part of the wattle of the mud and wattle houses, as well as part of fences, etc.

sheaths
fringed

Aug. 19 - Cordillera ^{de las Cruces} south of Rio Arroyo.

Hydrocotyle
20854

Hydrocotyle

in wet soil in trail

55

Xyris

on bare paramo ridge

56

Chusquea

common everywhere in paramo slopes

57

Polypodium

high rocky ridge

58

Hedyotis

high rocky paramo ridge
only seen in this vicinity, but
very abundant here.

59

Hedyotis

(same as above)

Crops cultivated here are potatoes (most important), wheat (a little), onions, *Vicia faba*, called "aba", and a kind of cabbage.

Trifolium repens and a round-leaved species of *Alchemilla* are favorite pasture plants. *Cupressus* sp. planted as ornamental.

Barley, radishes, carrots, anacacha said to be cultivated but not seen.

very prostrate

tufts

varying greatly in size

fronds erect

rounded dense bushes
1-2 m. tall, lower side of
leaf yellow, rest of leaf
bright green.

rounded bright green bush
1-2 m. tall, buds pinkish, fls.
white, undersid of leaves yellow

main north affluent of Rio Grande
Aug. 20 - Quebrada Huerfana south
of Cordillera de las Cruces.

Meta

wet forest in deep ravine

20360

Begonia

epiphytic and on ground, common

1. 61

Polypodium

epiphytic

2. 62

epiphytic

3. 63

Espelletia

subparamo bush, occasional

2. 64

Chusquea

abundant in flat ravine bottom,
subparamo bush.

7. 65

~~common~~ occasional in forest

4. 66

Blechnum

common locally in sub. paramo
bush and ~~at~~ edge of forest.

(photo
not of
different
plant)

3. 67

Chusquea

common in region.

1. 68

Fuchsia stipularis

rare, near stream

stems fleshy, fls. pink.

fronds bent downward.

vine, ~~climbing~~ climbing in
lower branches of trees;
somewhat fleshy; corolla
flesh-orange, pitcher-like,
pendent.

stem 15 m tall, ^{yellow, dist.} ~~very~~ dull yellow

3 m. tall, or more, forming
small bushes, mostly
flowering.

vine climbing in trees.

fl. dull orange.

on a trunk 1.5 m tall, 20 cm.
thick, but largely of leaf
bases and ~~moist~~.

forming dense tangles,
this thicket the only one seen
in flower.

erect, single stem, fls.
red.

Aug. 20 - ~~Quebrada Humedita~~,
main stream south of Cordillera
de las Cruces.

dense river-bank forest.
20869 Psychotria

70 Guettarda

Aug. 21 same loc.

71 Gunnera
steep wet low cliffs above river

72 Fuchsia
steep banks & overhanging
river-bed.

73 fallen tree in river-bed.

74 fallen tree in river-bed

75 Nertera granadensis

steep wet banks of river

76 Cleome

steep bank of river

77
dense river-bank forest, in
deep shade

78 dense river-bank forest

79

dense river-bank forest

the slopes above this stream
are in places wooded with
almost pure stands of *Alnus* sp.
(*alisó*), noticeable because of white
trunks and very sparse foliage.
sparsely branched shrub 1 m.
tall, fls. and fruits white.
spreading tree. fruits
immature.

low erect stem 5 m. tall.
leaves ^{peltate} concave above. spikes
erect, much mucilage
around bracts at tip of
stem. some leaves twice
as large as one collected.
(photo) vine-like shrub, hanging
over other vegetation.

many clumps, all flowering,
fls. white, waxy.
rare

prostrate, fruits red.

shrub 1.5 m. tall, fls.
orange.

ripe fruit red, fleshy.

shrub 2 m. tall.
vine-like, fls. white.

- 20380 *Liabum*
abundant on overhanging river-bank
- 81 *Sanicula*
dense river-bank forest,
shady flat.
- 82 *Psychotria*
shady flat, dense river-bank forest
- 83 *Vaccinium*
overhanging river-banks, on low cliff.
- 84 *Pilea*
on fallen tree in dense river-bank forest.

Aug. 22 - Rio ~~Huandoy~~ ^{del Nevado}, east
end of Cordillera de las Cruces,
not far above confluence with Rio ~~Huandoy~~ ^{Trandoy}
rain forest on steep slope 7500 ft

- 85 *Cinchona officinalis* L.
edge of small opening caused
by landslide.
- 86 *Vittaria*
base of tree trunk
- 87 *Cinchona officinalis* L.
- 88 *Quercus*
- 89 *Cinchona officinalis* L.
- 90 *Cinchona officinalis* L. (see 20380)
- 91 *Cinchona pubescens* Vahl.

suffrutescent
pendent herb, caps
milky, fls. yellow.

fruit white, inflorescence
blackish.
pendent bracts red,
waxy, fl. white.
creeping tangled mass.

Meta

anal. Bellis:
g + c 4.6
(g + c) 3.47
Ci 0.7
TCA 5.3

Tree 3 dm. thick, 15 m. tall
(specimen from sprout), stipules
at and midribs reddish.
(bark sample).
somewhat flattened.

anal. Bellis:
g + c 4.6
(g + c) 3.47
Ci 0.7
TCA 5.3

anal. Bellis:
g + c 2.1
Ci 1.1
TCA 3.2

sapling 3 m. tall, green
single stem 1 m. tall
sapling 2 m. tall, green.
Tree 3 dm. thick, 15 m. tall,
(specimen from sprout) green.
(bark sample)
tree, divided at base, two trunks
each 4 dm. thick, 20 m. tall
(specimens from large sprout)
stipules recurved
(bark sample)

20892 *Cinchona officinalis*Ba. 1 lb
Ca. 4.3Anal. (Halls)
94C 3.9
(9504) 2.2
Ca 0.4
P 0.15
Fe 0.393 *Palicourea*94 *Psychotria*

Aug. 23 - same loc.

95 *Lycopodium*

abundant on an old landslide

96 Orchid

abundant on an old landslide

Aug. 24 - same loc.

97 *Lymbolanthus*top of long ridge in bushy quarried
ridge - top forest

98

steep slope above river canyon
small ledge99 *Viola*~~steep bluff~~ cliff left above
landslide, open soft rock.20900 *Lycopodium*Aug. 27 - Rio ^{del} Nevada, east end
of Cordillera Las Cruces, south of
Rio Arroyo, across from prominent
peak in Cordillera Los Laureles,20900a *Burmeistera*

Meta

20900 *Lycopodium*

cliff left above landslide.

01

steep slope, densely wooded,
occasional in this drainage
in similar situationstree 10 m. tall, 2 dm. thick,
green, fls. purple (bark sample)
(bark sample)shrub 1.5 m. tall, fruit yellow.
shrub, m. tall, fls. white,
fruit blue.
spikes pendent.

fls. pinkish white.

shrub 2.5 m. tall, flower
greenish yellow.vine-like, without stinging
hairs, forming a tangle,
flowers white.creeping, fls. light
violet

erect

shrub 2 m. tall, fls. orange-red
paler distally.

Aug. 27 - East end of paramo on
Cordillera de Las Cruces, south
of Rio Arroyo, meta

brushy sub-paramo slope

70902 Arragona

03 Hedysotis

common

Aug. 28 - Quebrada el Carino,
~~pedregal~~ main affluent of Rio Arroyo
on south side,

meta

paramo slope
04 Geranium
common

05

common in burnt over
wet marshy place

Aug. 28 - Quebrada de los Tambos,
affluent of Rio Arroyo, ~~pedregal~~ affluent
on south side,

meta

3 06

patch of woods on steep slope
surrounded by paramo

4 07

Calceolaria

~~marshy~~ marshy place in bottom
of valley

shrub 2 m. tall, fls. white, odorless.
~~shrub~~ bright green shrub
2 m. tall, leaves with yellow
stripes beneath, buds
pinkish, fls. white.

caespitose but small tufts,
branches weakly ascending.
fls. rose pink, paler distally.
in other places much
larger.

spikes erect fls. bronze-
yellow, striped with brown.
fls. yellow.

Aug. 28 - Quebrada Pedregal,
 this ~~the~~ main affluent of Rio Arroyo
 on south side,

Meta 11520

- 20908 Mimulus
 wet place trampled by cows

Aug. 29 - Rio Arroyo well above
 confluence of Quebrada Pedregal,
 bank of stream, edge of cultivated
 patch

Meta

- 09 Mimulus
 muddy places, abundant at
 this spot.
- 10 Epilobium
 muddy edge of cultivated ground.
- 11 Epilobium
 muddy edge of cultivated ground
- 12
- 12a
- 13 Valer
- 14 Centropogon ferrugineus
 det. McV.
- 15
 edge of bush
- 16 Fuchsia

spreading over mud,
 calyx purplish red, ~~the~~ corolla
 bright yellow.

stems succulent, erect,
 calyx greenish red,
 corolla bright yellow
 erect, fls. white, buds nodding.

moss less diffuse, fls. ~~pink~~ magenta,
 buds nodding.

shrub 3 m. tall. heads greenish
 rays white, leaves gray beneath.
 vine climbing in bushes.
 fls. white

wine-like shrub, climbing
 in bushes, corolla ^{deep} orange,
 paler distally, column white,
 anthers black, stigma white
 fls. yellow.

erect shrub 1 m. tall, single stem
 growing up through bush,
 fls. pendent, deep magenta

L 20917 *Hesperis matronalis*

L 18 *Manettia*
Climbing in bushes

L 19 *Polypodium*
rocks in bushes

L 20 *Capri*
edge of bush

L 21 *Galium hypocarpium*
edge of bush

L 22 Aug. 20 - same loc.
Galium
pasture with scattered subparamo
bush

L 23 Aug. 31 - Confluence of Rio Arroyo
with Rio del Nevado, meta
wooded and bushy in bluff.

L 24 in dense wet woods, probably
a parasite but not certainly

L 25 *Vaccinium*
dense shade

L 26 *Phoradendron*
bushy place, parasitic

L 27 wet bushy woods
Vaccinium

L 28 bush, abundant

stiff tree-like shrub 3 m tall,
fruit immature.

- twining vine, fls. pinkish

- fruit immature,
somewhat pale beneath,

- rhizome very glaucous
fls. whitish, stems ascending

tending to form vine climbing
in bushes. fruits orange,
fleshy.

prostrate to ascending, clambering
in clump of bush.

magenta purple, tessellate
with peltate projections,
surface of mass under
these red-pubescent,
scrambling shrub, fls.
fleshy, pinkish.

red-purple, terete

fls. greenish-white, waxy.

bushy shrub, fruits
yellow-green.

20923

brushy place

29 *Vaccinium*

brushy place, abundant

30 *Vaccinium*brushy place common but
not in flower except this

31

brushy place, common

32 *Ladenbergia*

brushy place, occasional

33

brushy place, common

34

Clusia

rocky bank of river

Sept. 1 - same loc. but below
Rio Arroz, west side of Rio Humadea
Meta35 *Pernettya*wooded river bluff
talus cone below cliff, wet with
streamlets of water, common36 *Miconia*sides of talus cone below
cliff, abundant37 *Pernettya*

wet talus cone below cliff

leaves fleshy, yellow-green,

- fls. greenish

- bushy shrub, fls.

pinkish-white.

- weak shrub, fls. red,
waxy.- sparsely branched
shrub 1.5 m. tall, fruit
green.shrub 4 m. tall, branches
erect, others seen up to
6 or 8 m. tall. leaves very
revolute.- sparsely branched shrub
1.5 m. tall, fls. greenish-red;
specimen from 2 plants.
small tree 5 m. tall.

low spreading shrubs

1-1.5 dm. tall, fls. white,

fruit black when ripe.

- fruits purplish, probably
not mature, shrub 1.5 m. tall.shrub 0.5 m. tall, fls. white,
ripe fruit black. Prob. same
as ^{to} 20935 but only one tall plant seen.

- 20938 *Nertera* ~~sp.~~
abundant ^{wet} on rocks below waterfall
- 39 *Rynchospora*
on wet talus cone below cliff
- 40 *Vaccinium*
epiphytic in tree, wet forest
- 41 *Laurajia*
wet thickets on rocks above river
- 42 *Vaccinium*
epiphytic in tree, wet forest
- 43 *Psychotria*
epiphytic on tree-trunk
- 44 *Psychotria*
wet forest
- 45 *Psychotria*
wet forest, occasional
- 46 *Psychotria*
wet forest, only one seen, terrestrial
- 47 *Psychotria*
wet forest, on fallen tree, only one seen in flower.
- 48 *Palicourea*
wet forest, occasional
- 49 *Nertera granadensis*
wet forest, on ground, common
- 50 *Psychotria*
wet forest, on fallen tree trunk

prostrate, creeping, forming a loose mat, leaves stiff, appearing distichous, fls. yellowish, fruit red, fleshy. Seems to be distinct from *N. granadensis*.

vine-like shrub, infl. and flowers wax-like, coral red slender sparsely branched shrub 2.5 m. tall, inflorescences pendent, fruit immature vine-like shrub, inflorescences and buds coral red, buds yellowish distally.

tree 6 m. tall, fls. brilliant deep purple, stamens yellow vine climbing in lower branches of trees, flowers pendent, orange. fls. light bronzed green.

flower bronzed green.

shrub 4 m. tall, fruit immature, infl. pendent. prostrate, creeping, forming loose mat or mats, fruits fleshy, red. fls. bronze-purple.

- 20951 *Palicourea*
~~open~~ bushy slope
 52 wet talus cone at foot of cliff
- 20952 *Centropogon ferrugineus*
 wet talus cone at foot of cliff
- 20953 *Palicourea*
 shrub 0.5 m. tall
 fl. yellow
 54 open wet talus cone at foot
 of cliff, common
- 20954 *Palicourea*
 open bushy slope
 55 edge of opening on wet talus
 cone at foot of cliff, tall bush
- Sept. 7 - ~~the~~ Confluence of Rio
 Arroyo with Rio Nevada to form
 Rio Tumadaca, Meta
 56 *Alnus*
 common along river banks
- 57 common near river banks,
 and in moist wet places.
- Sept. 7 - same loc.
 58 *Calceolaria mexicana* ^{subsp.} ~~subsp.~~ *mexicana* Benth.
 wet rocks by edge of river

shrub 2 m. tall, fruits
 immature.
 weak shrub up to 1 m. tall,
 spreading, leaves grayish,
 rays white, disk yellowish.
 scrambling shrub,
 corolla orange, column white,
 anthers black.
 erect.

vine, fls. bright red.

"aliso"
 tree 20 m. tall, 5 dm. thick,
 very sparsely leafy,
 conspicuous for this reason
 forming dense thickets,
 leaves more or less erect,
 up to 3 m. long when
 sterile, resembling some
 Liliaceae, infl. 3 m. tall,
 but some seen twice as tall.

"servitana"
 corolla yellow

det. Molau, 1982

- 20959 *Nertera*
rocks wet by splashing water
from river
- 60 *Vittaria*
on tree ^{trunk} near river
- 61 *Vaccinium*
in bush
- 62 "
on tree-trunk more or less in open
- 63 "
on tree-trunk more or less in open
- 64 "
abundant on tree trunk more or less in open
- 65 *Phoradendron*
common on ericaceous shrubs
- 66 *Vaccinium*
bushy slope
- 67 *Schefflera*
bushy slope, occasional
- 68 "
bushy slope, edge of forest
- Sept. 2 - Paramo above confluence
of Rio del Nevado and Rio Arroyo.
Meta
sub-paramo brush, open
because of grazing
- 69 *Vaccinium*
- 70 *Blechnum*

prostrate, mat-forming,
leaves stiff.

scrambling shrub, bracts
red, corolla pinkish white.
crisped

pendent

forming dense mat

terete, yellowish green,
berries white.

scrambling shrub,
fls. reddish.
tree-like shrub, 4 m. tall.

woody, vine-like, stiff,
fls. yellow.

shrub, forming tangled thicket
fls. wax-like, dull coral-red.
paler ~~at~~ at tips.

(photo)

erect trunk 1.5 m. tall, 1.5-2 dm.
thick, mostly of old leaf-bases and
scabers, sterile fronds horizontal or
drooping, fertile ascending.

20971

72 *Gentiana*in clumps of grass & other plants
in grazed páramo.73 *Spiranthes*

grazed páramo

Sept. 5 - Quebrada Negra, 17 km.
s.w. of Cabrera, Ti.

Mun. de Pandi, Cundinamarca

wet forest, ~~in~~74 *Cinchona pubescens* Vahl

in small ravine, one tree seen.

75 *Solandra*in second growth brush in
clearing.Sept. 5 - Quebrada Negra,
15 km. s.w. of Cabrera,

Cundinamarca

wet forest on level plateau

76 *Cinchona officinalis*

one tree only seen.

Ra = 32
Ca = 0.577 *Nertera granadensis*very common weed in recent
clearings.Sept. 10 - Gateways 5 km. n. w. of
Cabrera on trail to San Andrés,
n. and e. of Rio Sumapaz,
CundinamarcaPáramo de Sumapaz
& Sumapaz regionshrub 8 m. tall, rays purple,
disk yellowish, turning
dark red-purple.plant dark reddish green,
fls. pale purple.

roots fleshy, fls. white.

Anal. Bellis
g+c 0.9
ci 0.5
qui 0.15
TCA 1.4

tree 12 m. tall, 10 cm. thick.

fls. pink, fragrant (bark sample)

~~scandent~~ scandent shrub,
fls. yellow.Anal. Bellis
g+c 2.7
(g+c) 4.0
ci 0.7
qui 1.1
TCA 3.5sterile tree, 2 dm. thick, 15 m.
tall, old leaves crimson red
(bark sample)prostrate, mat-forming,
fruit scarlet.Trail from Cabrera to La Colonia
runs up the valley of Quebrada
Negra (confused on map with
Q. de Pueblo Viejo), through

wonderful tall wet forest. The sides of this valley are rather gently sloping, rather than steep, and the forest is much better developed than on steeper slopes. *Cinchona officinalis* occurs here, but, as indicated by sprouts in cut over places, definitely localized in "manchari" rather than generally distributed. There is no apparent reason for this sort of distribution.

Sept. 6 - Plateau 5 km. n. n. w. of Cabrera, n. and w. of Rio Sumapaz, Mun. de Pandi, Cundinamarca
 Cleared of wet forest and grown up with second-growth brush.

20978

*Burmeistera*L 79 *Eche*L 80 *Eche*L 81 *Eche*

common

L 82 *Fuchsia*

common

L 83 *Pala*L 84 *Palicourea*

common

L 84a *Palicourea*

On both sides of the trail the forest is mostly cleared for a short distance, and a string of new finches are scattered along the trail. The clearing will likely go on rapidly till all of this is destroyed. In the cleared portion is brush about 3 m. tall, interlaced with vines. *Symbolanthus* is very common and conspicuous here, rather than scattered and rare as usual, all in flower.

Cinchona officinalis distributed locally here, as indicated by sprouts. *Symbolanthus* also common here and in flower.

- sprawling shrub, fl. bronze-green, fruits purple.

- ~~herb~~ herb, up to 1 m. tall.

- fls. brilliant crimson-red.

- scandent shrub, rays white

- scandent shrub, fls.

- deep orange.

- scandent shrub, flowers

- scarlet, pendent.

- sub-scandent shrub,

- fls. white.

- shrub 3 m. tall, infl. and

fls. yellow.

- 20995 *Conyza*
 common.
 86 *Cinchona officinalis*
 occasional locally
 Sept. 7. - San Bernardo, ~~Rio~~
 valley of Rio Negro, Cundinamarca
 Roadside banks and thickets
 87 *Conyza*
 abundant, moist places
 88 *Miconia sanguinea*
 thickets
 89 *Miconia*
 thicket
 90 *Eupatorium*
 91 *Galium hypocarpium*
 thicket
 92 *Conyza*
 thicket
 93 *Castilleja*
 moist places, not common
 94 *Rubus*
 thickets
 95 *Mikania*
 thickets
 96 *Backhousia*
 thickets

- sub-scarlet herb,
 fls. yellow.
 sterile stump sprout
 4 m. tall.
 mesophytic region, thickly
 populated and planted to coffee.
 (photos).
 prostrate with ascending
 branches, flowers yellow.
 shrub 2 m. tall, stems
 and infl. with purplish
 pubescence, fls. white,
 fruit green.
 vine climbing in thicket,
 buds whitish.
 erect herb 1.5 m. tall, fls. ^{fragrant} lavender.
 vine climbing in brush,
 fruits orange, fleshy, fls.
 greenish yellow.
 vine climbing in thicket,
 fls. yellow, fruit green.
 erect, calyx green, bracts
 tipped with scarlet, pubescent,
 glistening, whitish.
 vine-like, forming
 tangles ~~sweet~~ 2 m. deep,
 fls. pale pinkish, fruit
 black when ripe, insipid,
 not at all sweet.
 vine climbing in brush.
 fls. white.
 woody vine, leaves appearing
 distichous, flowers white.

20997

*Melastoma*98 *Solanum*99 *Phytolacca*21000 *Polygonum punctatum* Ell.det.
K.C.F.101 *Solanum*102 *Passiflora*
common103 *Cassipouira*104 *Solanum*105 *Drymaria cordata*106 *Plantago*107 *Galinsoga*108 *Verbena* *littoralis*109 *Bidens*110 *Borreria*111 *Adiantum*112 *Lycopersicon*
dry bankserect herb, 1 m. tall, fls. white,
infl. purplish-brown.herb 1 m. tall, buds with
purplish pubescence, fls.
white, fruit immature
(yellow and delicious when
ripe - the "tata" "lulo")coarse herb, stems
purplish, fls. magenta-pink,
fruits immature.weakly ~~erect~~ or
ascending, fls. white.
erect suffrutescent herb,
1 m. tall, fls. white.suffrutescent herb, up
to 1 m. tall, fls. deep yellow.prostrate, hanging over
banks, petals white, entire,
styles white 9 (n4)

erect, fls. whitish.

prostrate, hanging over
roadside bank, herbage
dull green, inflorescences
ascending, fruiting
pedicels very sticky.

infl. erect.

erect, rays white, disk yellow,
corolla lavender with
red tube. plant erect.rays white, disk yellow.
fls. whitesprawling herb, fls. pale lavender,
fls. purple, roots yellowish

L 71013 *Astrophya clachrophylloides* (J. E. Smith) DC.
det. S. Smith

L 2 14 *Pteridium aquilinum*
roadside

Sept

Aug. 9 - Rio Cuzja, 4 km. s. w. of
Fusagasuga, Cundinamarca 5300 ft.
Coffee plantation.

L 2 15 *Inga*

Sept

Aug. 9 - Valley of ~~Quebrada~~ Quebrada
Malagana, road from
Bogotá to Fusagasuga, 14 km.
n.e. of Fusagasuga, Cund.

L 2 16 *Nertera granadensis*
moist road cut, common

L 1 17 *Vaccinium*

moist road cut

L 1 18 *Psychotria*
moist road cut

~~11 *Psychotria*~~

Sept

Aug. 9 - Valley of Quebrada
Malagana, road from
Bogotá to Fusagasuga,
15 km. n.e. of Fusagasuga, Cund.

L 1 19 *Gunnera*
wet slope by road

L 1 20 *Perinetia*
stream bank

L 4 21 *Tropaeolum*
slope above stream

spreading herb, fls. white
or pinkish white.
rhizome deeply buried

tree 5 m. tall, stamens white,
used as shade tree.

prostrate, fruits fleshy,
red.

prostrate, fruit light purple.

prostrate, hanging.

stem short, upturned.

fruit fleshy, purplish on
one side, whitish on other.
extensively creeping and
climbing vine, spur coral-red,
petals & sepals buff-yellow.

- 11022 Alchemilla
roadside near stream
73 Uncinnia phleoides
roadside near stream

✓ Sept. 14 - pass between Alban and
Facatativa, 2 km above Alban,
Cundinamarca 2650 m.
brushy slope, cut-over hillside

- 74 Cinchona pubescens
small tree

| | | | |
|------|------|------|------|
| Al | Al | Al | Al |
| 1.45 | 1.18 | 1.30 | 1.30 |
| 0.72 | 1.21 | 1.31 | 1.31 |
| 1.64 | 1.07 | 1.77 | 1.72 |

- 75 Quercus humboldtii
steep slope, patch of oak woods
76 Parath.

Parasitic on Cinchona pubescens
✓ Sept. 14 - just above San Bernardo
half way between Alban and Pasajima
Cundinamarca.
second growth woods.

- 77 grass
edge of road clearing
78 Palicourea

- 79 Parath.
common

- 80 Psychotria

- 81 Palicourea

prostrate

large dense clump

small tree 7 m. tall 1 dm
thick, flowers mostly
dried, fruits immature
and others shattered. (bark sample)
fruiting tree 15 m. tall, 2 dm. thick
a) flowering tree 10 m. tall, 2.5 dm. thick
immature fruit orange,
mature fruit black

Tall cane, 4 m. tall, growing
up through bushes
fruit green, infl. purple,
weak shrub.

erect herb, fls. white

erect subshrub 0.8 m. tall,
fruit light purple.

shrub 2 m. tall fls. greenish-
white.

Sept. 19 - Falls of Tequendama,
Cundinamarca
slope just above falls

L 710 32
Panicum

Sept. 20 - ridge bet. Rio Piedras
and Rio Guilaque 5 km. n.e. of
Dolores, Cauca.
thicket along fence at side of
road, cultivated land.

L 7 33
L 5 34

Croton

very common throughout region

#7 km. s.e. Popayán

Sept. 26, #2 w. side of valley of Rio
Guachicono, 8 km. n.e. of El
Bordo, Cauca

on weedy road embankment.

L 7 35
L 4 36
L 2 37

Acanthospermum

Borreria

Croton

abundant

L 3 38

Croton

L 3 39

Laurencia?

L 3 40

Waltheria

common

L 2 41

Croton

tree 5 m. tall, fls. white
(same tree as #21868)

shrubby tree 3 m. tall.
small trees 4-5 m. tall, others
much larger, old leaves
turning bright red.

prostrate, bracts green, fleshy

erect, fls. white.

heads whitish, plant 1 m. tall

erect, weak shrub 1.5 m.

tall, heads yellow

erect, lower leaves dead

and fallen, heads purple.

erect, up to 1 m. tall.

erect, heads whitish.

- 42 ✓✓ Sept. 27 - Morasurco Ridge, 10 km.
n.e. of Pasto (km. 15 on road to
Popayan). Nariño
- L 21042 *Gunnera*
wet slope at base of cliff, common
- L 1 43 *Daucus*
wet roadside
- L 5 44 *Cuscutorium*
thicket above road
- L 1 45 *Drymaria cordata*
roadside thickets
- L 1 46 *Epilobium*
wet banks
- L 2 47 *Ischaemum*
wet banks & cliffs
- L 5 49 *Maya*
wet roadside
- L 1 50 *Veronica*
roadside
- L 2 51 *Malvastrum? cotinifolia?*
wet slope, mud, abundant
- L 2 52 *Centropogon*
thicket above road
- L 5 53 *Solanum*
disturbed ground along road.
- L 1 54 *Galium hypocarpum*
thicket above road
- L 1 55 *Centropogon leucophyllus* Gleason
thicket above road det. Mel.
- L 2 56 *Castilleja*
roadside thickets
- L 1 57 *Calceolaria mexicana* Benth. subsp. *mexicana*
wet base of cliff
- L 2 58 *Jesner*
crevices in cliff.

- rhizome short, prostrate
with erect
- spreading herb, fls.
white.
- fls. white.
- fls. purple
- fls. white with purple
dots on lips
- prostrate, fls. white.
- fruits mostly shattered
- fl. orange, column white
anthers black. scandent shrub.
fls. deep purple
- vine-like herb, fruits orange,
fleshy.
- scandent shrub, flowers
bright red., anthers deep purple.
- bracts & calyxes tipped with
scarlet.
- prostrate, fls. yellow.
- pendent, fls. bright red.

det. Molan
1982

Sept. 23 - Cliffs n. of
Rio Bobo, 10 km. e. of Imaes,
29 km s.w. of Pasto, Nariño
21059 *Hedyotis thymifolia*
road cut, crevices

Sept. 30 - Bridge across Rio
Bobo, Guaitará, at confluence of Rio Bobo,
6 km. e. of Imaes, 29 km. s.w. of Pasto, Nariño
dry cliffs above road.

60 *Tillandsia*

very abundant in rock crevices,
also seen on bushes and trees.

61 *Delaginella*

62 *Cheilanthes*

Oct. 1 - Rio Guabo, 3 km. below
Piedrancha, Nariño 1700 m.

63 *Sarapija*

fence-row in dry valley bottom

Oct. 1 - Rio Guabo, 8 km. below
Piedrancha, at Curculle area
just above San Miguel, Nariño
Wooded bottom of ravine 1550 m.
at foot of hills.

64 *Croton*

65

undergrowth

fls. white, corolla lobes patent

tufts.

forming thin mat, adhering
to rocks, spreading as
much as 0.5 m.
curled up when dry.

small tree 4 m. tall,
fls. white.

Cinchona pubescens common
here at foot of hills - good
sized trees, but mostly harvested.
stump and root sprouts common, especially
in cut-over areas.

shrub 4 m. tall, others form
trees up to 10 m. tall, old
leaves red.

shrub 1 m. tall, fl. white.

21066

along trail, partially shaded.

L 67

Solanum

in undergrowth, partially shaded.

L 68

Palicourea

undergrowth

L 69

Tournefortia

undergrowth

L 70

Psychotria

undergrowth

L 71

Psychotria

undergrowth

72

Psychotria

undergrowth

73

Myrsine

undergrowth

74

Boehmeria

undergrowth along stream

75

Hedyosmum

76

Borreria

rocks along stream

77

Ladenbergia

slope

78

Passiflora

79

*Bocconia*fls. orange red, orifice
of corolla small.

shrub 2 m. tall, fls. white.

fruit immature.

shrub 1.5 m. tall, fls. yellow,

infl. coral red, in fruit

turning yellow, fruits immature.

small tree, fls. white,

leaves conspicuously

reticulate - rugose

slender shrub 2 m. tall.

shrub 2 m. tall, ripe

fruits purple, ^{black} shiny, fleshy.

shrub or small tree 5 m.

tall, inflorescence pendent.

shrub 2 m. tall, fruit

immature.

shrub 2 m. tall,

infl. pendent.

tree 6 m. tall, aromatic when

broken, fruit white, fleshy.

fls. white.

"quina roja"

tree 10 m. tall veins reddish

beneath, buds white. (bark sample)

shrub 2 m. tall, bud

enclosed in hard gum.

"barniz de Pasto" used to

make a lacquer for wood.

erect shrub 3 m. tall, fruiting

inflorescence pendent, sap

orange, used to color clothes.

21080

Meth.

parasitic on *Cinchona pubescens*581 *Rondellatia*

582

undergrowth

783

584

Meth.

585

Meth.

parasitic on #21084.

786

Capsicum

undergrowth

487

Cinchona pubescens Vahl

788

Ladenbergia

L89

Cinchona pubescens Vahl

L90

Vismia
edge of forest"mata palo", said to destroy
coffee trees. dark green.

- small tree, 5 m. tall.

slender shrub 4 m. tall,

- fruit black, fleshy.

small tree, 5 m. tall,

- fls. white.

- small tree, fls. whitish.

fruit white, translucent,

- spherical. "mata palo". light green.

shrub 2 m. tall, fruit

immature. fls. whitish.

pounded leaves used to cure

fever and worms in children.

partially dead tree, ^{leaves} ~~and~~ ^{stipules} green, turning red,

stipules green, turning red,

carinate, fruit immature,

- "quina amarilla".

slender tree 6 m. tall,

veins reddish beneath.

- "quina roja".

tree 10 m. tall, leaves dull above,

old ones red, fruits immature

(bark sample).

- small tree, leaves ~~very~~

coppery beneath. This

tree is said to grow from

the dead body of a worm.

The worm shown me was

a scarab larva which

had ~~fungus~~ a club-shaped

fungus growing from it.

In alternate years the beetle is

supposed to emerge, the other years

the tree.

Anal. Bellis
9+10 0.4
Cin 1.4
T.C.H. 1.4Anal. Bellis
9+10 0.4
Cin 1.4
T.C.H. 2.3

21091

Crocothylaceum

cut above trail at edge of forest

✓ Oct. 1 - Piedrancha, Rio
Guabo, Nariño 1850 m.

92 *Micandra physalodes*
weedy vacant lot

93 *Buddleia*
weedy vacant lot.

94 *Tecoma stans*
garden, cultivated

✓ Oct. 2 - Curuculo area, just above
San Miguel, ~~3 km. below~~ Rio Guabo
3 km. below Piedrancha, Nariño.

1950 m.

95 *Tephrosia toxicaria*
in cultivated ground

96 *Ixora* ~~in~~
in underbrush along ~~pasture~~ stream

97 *Begonia gracilis*
in underbrush along stream,
common in region up to 2000 m.

✓ Oct. 2 - mountains 5 km n.w.
of Piedrancha, Nariño. 1950-2150 m.
rain forest on steep north slope

prostrate, fls. lavender,
fruit soft, ~~pyriform~~ pyriform,
blue.

herb 1.5 m. tall, fruit
yellow. said to cause
insanity if eaten.
- suffrutescent herb,
fls. whitish.
- small tree 9 m. tall,
fls. bright chrome yellow,
fls. used for excessive
menstrual bleeding.

used as fish poison.

herb 1 m. tall.
shrub 2 m. tall, inflorescences
cauline, coral red, fls. orange-
red with yellow lobes.
erect herb 5 m. tall, stem
very thick, fls. white.

A very hairy form of *Linchoma pubescens*
common in this area. mostly
small sprouts below. larger
trees common at 2000 m. on
west sloping ridge.
smooth form barely reaching 1900 m.

- 21098 *Schraggedlyx hirsutus* 1900 m.
 99 *Cephaelis axillaris* 2150 m.
 in undergrowth, common.
 21100 *Mussaenda*
 in undergrowth, rare 2150 m.
 01 *Cinchona pubescens* Vahl. common ~~under~~
 02 *Mussaenda* 2200 m.
 in undergrowth
 Anal. Bull. 03 *Cinchona pubescens* 2250 m.
 9+C 0.2
 Ci 1.1
 Qui 0.1
 T.C.A. 1.2
 04 *Mussaenda* 2150 m.
 undergrowth
 05 *Mussaenda* 2150 m.
 climbing in *Cinchona pubescens*, tall
 06 *Cinchona pubescens* Vahl. 2100 m.
 Anal. Bull. 06
 9+C 1.3
 Ci 0.7
 Qui 0.1
 T.C.A. 2.0
 07 *Cinchona pubescens* Vahl. 1750 m.
 young shoots common, large trees not
 seen at this altitude
 08 *Cyclanthus*
 occasional 1700 m.

- small tree, 8 m. tall, many
 seen but all sterile.
 - suffrutescent herb 1 m. tall,
 fruits blue, flowers white,
 stems green.
 - small weak shrub, flowers
 green.
 - tree 20 cm. thick, 12 m. tall,
 old leaves red, fruits reddish.
 (bark sample) "guina lanuda".
 - shrub 1-5 m. tall, infl.
 purplish-red, berries
 lavender. Twigs reddish beneath,
 tree 10 m. tall, 15 cm. thick,
 fruits reddish, old leaves
 red. "guina lanuda" (bark sample)
 - slender shrub 3 m. tall,
 fruits immature
 - ~~herbaceous~~ herbaceous vine.
 tree 10 m. tall, branched at base,
 trunk cut 15 cm. in diam.
 - "guina lanuda" (bark sample)
 - young shoots ~~1-1.5 m. tall~~ 1-1.5 m. tall,
 "guina lanuda"
 - rhizome short, thick, apex erect,
 leaves bifid to base, about
 3 mature leaves on plant.

✓✓ Oct. 3 - Quebrada Panacual,
8 km. S. of Piedra Negra,
Rio Guabito drainage, Narino.
sparsely wooded, bushy ravine. 2800 m.

L 21109 Phytolacca

L 3 10 Fresia

L 4 11 Lipanura

L 5 12 Cinchona pitayensis
small mancha of five
or six young, sterile trees,
no seedlings.

L 4 13

L 14 Galium hypocarpium

L 15

on fallen tree

L 16

Palicourea

Oct. 3 ridge W. of Quebrada
de Piedra Negra, 8 km. S. of
Piedra Negra, Rio Guabito, Narino
dry wooded over steep slope. 2800 m.

L 17

common in dry part of ravine

low spreading coarse
herb, fls. magenta-pink,
berries black when ripe.
herbaceous vine scrambling
over bushes.
shrub 4 m. tall, with
lemon-grass odor, leaves
very rugose, fls. greenish-
yellow, fruits spherical,
covered with soft projections,
rose-colored.

| | |
|-------------|-----|
| Anal Bellis | |
| 96 C | 1.4 |
| 60 C | 2.5 |
| 70 C | 1.0 |
| T.C. 19 | 4.9 |

tree 3 m. tall, 1 dm. thick,
only branched near top,
leaves green, somewhat
lustrous above (bark sample)
erect suffrutescent herb,
fls. yellow.
vine-like, fruit fleshy, orange.
fls. rose-pink

erect shrub 4 m. tall,
infl. deep blue, fruit green.

tree 5 m. tall

21118

Vaccinium

dry part of ravine

L 5 19

dry part of ravine

21

Oct. 3 - ridge sw. of Guelrada
de Pueblos Viejos, 6 km. n. of
Piedrancha, Rio Guabo,
Nariño 2800 m.

L 3 20

Alnus

abundant from here down
to river, dry burned-over slope.
most plants appear dead
from fire.

L 4 21

vertical rock outcrops

L 6 22

Gunnera

colony around spring
in brake of very tall Chusquea

2700 m

L 1 23

Solanum tuberosum

cultivated (with #21124)

L 1 24

Solanum tuberosum

cultivated (with #21123)

low spreading bush,
fruit translucent, white.
tree 6 m tall, fruit
black when ripe.shrub 1.5 m. tall.
"alias"densely caespitose,
have been burned so
all shoots are new,
fls. flame-red.
rhizome short, almost erect,
some gelatin at apex,
apex of rhizome when cut
shows what appears to
be symmetrically arranged
colonies of blue-green algae
within the tissue;
leaves ascending,
somewhat funnel-
shaped, infl. purplish.
3-4 mature leaves on plant
fls. purple "papa"

2300 m.

2300 m.

fls. white "papa"

- 21125 *Hedyotis thymifolia*
dry slope, along trail in
disturbed place
- 26 *Hedyotis*
dry slope, sparse bush
- 27 *Hedyotis thymifolia*
dry slope, cut above trail

✓ Oct. 3 - Rio Guabo, mouth
of quebrada de Pueblos Viejos,
4 km. s.e. of Piedra Blanca, Narinas

- 28 *Alnus*
thickets at foot of
steep slope, abundant
- 29
dry river-bottom or "vega"
- 30 *Alnus*
dry bank of river, abundant
- 31
dry river-bottom or "vega"
- 32 *Psidium guineense*
dry pasture
- 33 *Hedyotis*
dry lower slope, common
in rain-burned places
- 34 *Eugenia*
common on brushy lower slope
- 35
on tree trunks on river-bank

- 2350 m. small shrub, fls. white.
- 2250 m. low spreading, ~~and~~ rigid
springy bush, ^{all} fls. white,
fruit immature
- 2250 m. small shrub, fls. white.
- 1975 m. shrub 5 m. tall, "aliso"
- 1950 m. small tree 4 m. tall,
fruit black.
- 1940 m. shrub 2 m. tall "aliso"
- 1950 m. shrub 5 m. tall, branches
ending in tufts of ~~leaves~~
looking like *Rhus*, fls. pendent,
white.
- 2050 m. low bush 1 m. tall, fls. white.
- 2050 m. small bush, fls. white.
- 2000 m. small box-like trees,
2-5 m. tall, fls. white,
leaves dark green.
- 1940 m. caespitose, sepals bronze,
petals white

- Oct. 4 - n.e. ridge Volcan Gualcala, about
3 km. n.e. of summit, 18 km. s. of
e. of Piedrancha, Nariño
sharp boundary bet. 2600 m.
paramo and subparamo

21137 *Hedyotis*
abundant at upper edge
of subparamo.

36
vertical mossy cliff

- Oct. 4 - head of Rio de El Cristo,
4 km. n.e. of summit of Volcan
Gualcala, 18 km. n. of e. of
Piedrancha, Nariño,
scrubby forest 3000 m.
38 *Palicourea*

- Oct. 4 - Upper Rio Gualcala
5 km. n. of summit of Volcan
Gualcala, 17 km. e. of
Piedrancha, Nariño.
scrubby forest overgrown 2700 m.
with *Chusquea*

39 *Nertera granadensis*
in trail

- Oct. 4 - Upper Rio Gualcala, 5 km.
n. of summit of Gualcala,
17 km. e. of Piedrancha, Nariño
2600 m.

40 *Galium hypocarpium*
fracture, mossy bank

shrubs up to 0.5 m. tall,
fls. pinkish purple
outside, whitish within
fls. greenish-yellow.

shrub 2 m. tall, infl. yellow,
fls. white, waxy, fruit
dark blue, mostly shed.

prostrate, fruit orange

fruit orange, fleshy

- 21141 *Nertera granadensis*
vertical mossy bank in clearing

Oct. 5 - Upper Rio Hualcala, 5 km.
n. of summit of Volcan Gualcala,
17 km. e. of Piedrancha, Nariño
steep slopes above stream, 2500 m.
densely overgrown with Cheesquees
42 *Gunnera*
along trail

prostrate, fruits range to
red.

rhizome ascending 4 dm. long
3-4 leaves on plant. leaves
rugose above, infl.
almost horizontal.
This plant is about
average size others twice
as large and very much
smaller. Fairly uniform
here in leaf outline. becoming
more deeply lobed
more scabrous above
but perhaps all one
species, up to # 21164
in the upper edge of
sub-paramo 1000 m. above,
uniformly more slender
than others I have
seen of same affinity.
Petioles and inflorescence
slender. Bud smaller
with few bracts. All
plants in fruit, this
one with fruit green, others
red.

Oct. 5 - Headwaters of
Quebrada (Rio) de El Cristo,
4 km. n.e. of summit of
Volcan Gualcala, 18 km.
n. of e. of Piedra Blanca, Narino
sparse wet forest with
much underbrush.

1143

Melast.

common in undergrowth

44

Eupel.

in second growth brush.

45

in second growth brush

46

Passiflora

in second growth brush

47

Eupel.

vertical banks above trail

48

Cinchona pitayensis

49

Palicourea

50

Cinchona pitayensis

51

Cinchona

in humus, barely emerging

Cinchona pitayensis is fairly
common and distributed in the
forest between about 2900-3000 m.
the larger trees, up to 25 cm. thick
being practically all harvested.
Hundreds of saplings or sprouts
up to 5 cm. thick remain. All slopes
low shrub up to 1 m. tall.

2700 m.

calyx and infl. red, corolla
yellow.

2800 m.

elongate shrub, fruit
vertically compressed or
flattened.

2900 m.

vine, fls. yellowish
white, leaves somewhat
thick.

2900 m.

vine, leaves slightly
glaucous beneath, fls.
pendent, calyx and
corolla light magenta
corona of white warts
on a purple ring. "tausa"

2900 m.

stiff caespitose herb
1 m. tall, fls. deep orange.

2900 m.

young plant, possibly a
root-sprout, 4 m. tall, sterile.

2900 m.

shrub 2 m. tall, infl.
blue-black, fls. blue,
fruit blue-black.

2900 m.

very young plant, less
than 1 m. tall, leaves very large

2850 m.

~~pellate~~ appendages
forming a tessellated surface,
these rose-pink, head spherical.

- 21152 *Cinchona pitayensis*
 small group of trees
 bottom of ravine
 54 *Cinchona pitayensis* Wedd.
 sloping side of ravine, common.
 55 *Bumelia*
 top of ridge
 56 *Cinchona pitayensis* Wedd.
 57 *Cinchona pitayensis* Wedd.
 bushy clearing
 Oct. 5 - N.E. ridge of Volcan
 Guacala, 2-3 km. N.E. of
 summit, 12 km. S. of C. of
 Piedra Blanca, Narino
 58 *Hedyotis*
 transition bet. forest and subparamo
 common from here to top of
 subparamo.
 59 *Palicourea*
 upper edge of forest
 60 *Bernieria*
 sub-paramo, common

- 2950 m. small, much-branched
 sterile tree, more or less
 2950 m. sprawling, 6 m. tall
 herb 1 m. tall, calyx reddish
 green, corolla with small
 orifice, yellow above, red
 beneath
 2950 m. tree 12 cm. thick, 15 m. tall.
 branched only at top, old leaves
 red, lower glossy above,
 fls. deep purple with white
 hair, fruits in all stages
 of maturity, bark ^{white} turning
 red-brown quickly when
 cut. (bark sample)
 3000 m. tree 6 m. tall.
 3100 m. young tree 4 m. tall, sterile
 2900 m. stump sprouts 1 m. tall.
 3150 m. fls. pinkish-lavender
 outside, white inside
 shrub 7 dm tall
 bush 1.5 m. tall, infl. blue-black
 fls. dull blue.
 3200-3500 m. sepals vermillion, petals
 yellow spotted with purple,
 fruit yellow, globose.

21161

Senecio

subparamo, also common in paramo

62 *Polak.*

upper edge of subparamo

63 *Blechnum*common in subparamo, also
in forest below.64 *Gunnera*upper edge of subparamo
apparently upper extreme
of # 21142, but much
smaller, ^{leaves} much moreOct. 5 - ^{upper} e. slope of Volcan
Gualacaopen steeply sloping 3500-3600 m.
paramo with grass and
Espelletia the principal components
of the vegetation.65 *Equis?*66 *Espelletia*
common67 *Lycopodium*

hanging over cut bank above

68 *Acaena*

clumps along trail

shrub 1 m. tall, leaves
glaucous, heads yellow,
erect in flower nodding
in fruit.shrub 1 m. tall, corolla
orange, column whitish,
anthers blackish.
sterile fronds prostrate,
fertile ones erect, rhizome
short, thick.rugose and
scabrous, infl. much more
dense.forming a dense hummock,
fls. whitish, fruit purple-
brown.caulescent, up to 2 m. tall,
infls. ascending, heads
yellow.
prostrate, spikes erect.

bushy, 0.5 m. tall.

- 21169 Valeriana
 4 common
 70 Vaccinium
 common
 71 Castilleja
 common
 72 Peinettia
 common
 73 Lolita
 scattered along disturbed
 bank above trail
 74 Peinettia
 common
 75
 cut bank above trail, one plant
 seen

Oct. 5 - near Guachique, s.e.
 slope of Volcan Gualcala.
 15 km. e. Piedra Blanca Paramo
 3500 m.

- 76 Loasa
 thickets along trail, near
 cultivated ground in paramo
 77 Lantana
 78 Baccharis
 grazed place in paramo

Oct. 6. Oscurana, village on s. slope
 of Volcan Gualcala

3150 m.

- 79
 Cult. in garden said to have been
 transplanted from paramo nearby.

- slender shrub 0.5-1 m. long,
 sprawling, fls. white
 almost prostrate, berries
 blue.
 tips of bracts red, calyx
 green, corolla yellowish
 distally
 low shrub, fls. white
 shrub up to 0.8 m. tall,
 fls. gray, drying on plant
 low bushes, fruit black.
 small bush, fls. yellow.

- sprawling stinging herb
 up to 1 m. tall, fls. orange.
 fls. red, ripe fruit black.
 heads whitish

- shrub 2 m. tall, leaves pungent
 fls. red-orange.

2/1/30

- 1 81 *Lathyrus*
 cult. in garden
 2 82 *Breconia*
 cult. in garden
 1 83 *...*
 thickets around cultivated ground
 1 84 *Calceolaria lamiiifolia* HBK. det. M. L. ...
 roadside
 2 85 *...*
 thickets in ravine
 2 86 *Fuchsia*
 common in second-growth brush
 throughout region.
 1 87 *Myrsotis*
 roadside
 2 88 *Mutisia*
 thicket in ravine

✓ Oct. 6 - slopes of Volcan Guadalupe
 above Mallama,

Nariño.

- 1 89 *Tournefortia* 2200 m.
 second growth brush
 3 90 *...*
 common throughout region
 1 91 *Pilea*

- fls. dull orange
 fls. deep rose-purple
 shrub 3 m. tall.
 fls. magenta
 fls. sulfur-yellow
 herb 2 m. tall
 shrub 2-3 m. tall, fls.
 pendent, vermillion,
 buds greenish-tipped.
 fls. lavender.
 herbaceous vine climbing
 in trees and bushes, heads
 pendent, rays bright scarlet.
 spreading bush 1 m. tall
 fls. purplish-white.
 shrub 1 m. tall, fls.
 magenta.
 erect, 1 m. tall.
 inf. purplish.

✓ Oct. 6 - slopes below Mallamé,

Nariño

dry brushy, burned ^{over} slopes. 2475 m.

21192 *Hedyotis* *longifolia*
common on dry slopes

293 *Lantana* 2450 m.
trail-side

394 *Miconia* 2300 m.
common

295 *Ambrosia* 2300 m.

296 *Hedyotis* 2150 m.

common on dry slopes up to 2475 m.

397 *Mimulus*
mud where trail crosses rivulet

✓ Oct. 9 - Mongón, 20 km. e. s. e.
of Barbacoas on Rio Telembí,
Nariño

slopes and cliffs just above river 50 m.

98 *Gonzalagunia*
wet cliff

399 *Tournefortia*
wet cliff

21200 *Comp.*
wet cliff, abundant

501 *Rub.*
weedy slopes at base of cliff

202 *Pol.*
weedy slopes at base of cliff

303 *Comp.*
weedy slope

fls. white, lobes patent.

suffrutescent herb,
fls. pinkish-purple.
Used medicinally.

shrub 2 m. tall,
fruits purple.

shrub 2.5 m. tall.

fls. white, lobes patent.

prostrate, fls. yellow.

shrub with long pendent ^{fleshy} stems,
spikes pendent, fruit white,
shrub 1 m. tall, fls. whitish.

shrub up to 4 m. tall, fls.
white, fruit bluish.

twining vine, flowers
whitish, fruit red, fleshy.

herb, m. long, fls. whitish,
in small scorpioid cymes,
odor of plant musky when

broken.

bushy herb, heads white.

21204

Cuphea

rocks at base of waterfall
wet with spray

Oct. 9 - same loc.

150m.

Tops of low hills above
river bluffs, dense
tall ~~forest~~ rain forest
with a clay-like soil,
little humus and little
underbrush.

5 05

Faramea

7 06

Rubi.

8 07

Faramea

common

6 09

Cephaelis

common

Oct. 10 - high ground, ^{and river margin} south
of Barbacoas, along Rio Guagui,
Nariño
second growth, ^{wet} woods 40-50m.

6 09

Cephaelis

not common, growing with #21200
on higher ground.

bush 0.5 m. tall,
fls. pinkish.

* slender shrub, fruit
greenish-black.
small tree 6 m. tall,
ripe fruits dark blue
said to be called "capitans"
in chochos and used for fevers.
small tree, 6 m. tall
fls. pale blue-lavender,
fruits lavender when ripe.
infl. white.
weak shrub up to 2 m.
tall, bracts bright red,
fls. ~~whitish~~ ^{yellowish} fruits
dark blue, if very
blue-black.

soil clay-like, little
humus.

brittle suffrutescent herb
up to 2 m. tall, bracts brick
red, fls. white.

21210
9*Cephaelis*high ground, common, growing
with #21209.

5 11

*Palicourea*bush at top of gravel
beach, vega of river

2 12

arb.

crotch of tree along river

L 13

Coccyzpselum

under trees on high ground.

3 14

Rub.

in bush on high ground

3 15

*Diodia*wet ground, somewhat open,
near stream

Oct. 11 - trail west of Pimbi,
between Pimbi and Rio
Telembi, 10-15 km. S. of
Barbaceras, Nariño. 5200m.
dense bushy woods, clay-like
soil with streaks of
gravel.

5 16

ridge top

L 17

Vaccinium

suffrutescent herb up to 1.5
m. tall, fls. yellow, fruits
bright blue, pyriform,
fleshy, not glossy,
bracts scarlet, becoming
orange in age.

- scandent shrub up to
4 m. tall, infl. coral red,
fl. lemon yellow, fr. immature.
- leaves grass-like, flowers
white, marked with purple
inside.

- prostrate, fls. lavender,
fruits fleshy, bright blue.
- woody vine

weakly ascending herb,
(others seen climbing
as much as 2 m. in bushes)
fls. white.

tree 10 m. tall, leaves
light green, buds pinkish,
bark exceedingly bitter
vines hanging from tree
bracts pink.

Oct. 11 - Rio Telemby 10 km
e. of Barbacoas, Nariño
~~at~~ bank of river at
mouth of muddy inlet,
sometimes submerged. 41 m.

21213

Psychotria

4

common on steep bank.

Oct. 11 - Pimbi, 15 km. e. of
Barbacoas, Nariño 2000
clearings in wet forest.

19 Palicourea ignea or purpurea
common along trail

270 Monina.

Oct. 11 - Trail north of Pimbi,
15 km. e. of Barbacoas, Nariño
dense wet forest 50-75 m.
on clay-like soil containing
some gravel.

Cinchona barbacensis
top of small ridge, only
one small colony seen.

Huel. Bellis 21

G+C n.m. to

C. n.m. to

Qui n.m. to

78

shrub, 5 m. tall, fls.
white, fruit red when ripe

herb up to 1 m. tall,
infl. red, fls. ^{very} pinkish,
fruit immature.
- suffrutescent herb 1.5 m.
tall, rachis red-purple,
fls. violet, fruit black
when ripe

vine-like shrub or small
shrub, apparently from
a common underground
stem which has decayed
individual branches
up to 60 cm long, branching
and tangled with other
small trees, base not
more than 4-5 cm thick,
buds pinkish, very few
seen, capsule almost
ripe. Stem producing
aerial roots. Bark very bitter,
bark small.

21272 Herb.

4 23

wet ground along creek

1 24 *Liparuna*

side of ravine above stream

A. J. Bell's
 9+ 10-11-12
 C. J. Bell's
 9+ 10-11-12
 1944 04

1 25 *Psychotria*

side of ravine

4 26 *Cephaelis*1 27 *Bouvardia* *Diodia ocimifolia* (Willd.) Brem.

side of trail

1 28 *Palicourea*~~shrub 4m~~

700 100 m.
 Oct. 13 - 7 am. 1944 - 100 m.

rather scrubby, bushy wet
 woods, clay soil.

1 29 *Panicum*

wet seep in old quarry

1 30 *Jussiaea*

trickle of water in old quarry

1 31

common in open wet places

1 32 *Polygala*

wet banks along road

1 33 *Utricularia*

wet places along road

1 34

rare, moist bank.

shrub 4 m. tall, fls. bluish
 suffrutescent herb up to
 0.8 dm. tall, fls. white,
 very fragrant.

slender shrub,
 sparsely branched,
 slightly aromatic
 brittle herb, fls. whitish.

small tree 5 m. tall,
 bracts purple, fruit
 blue, fleshy.
 fls. white.

shrub 4 m. tall,
 infl. coral red, fls. yellow.

cate

2 white

leaves dark green, fls.
 white, roots with wintergreen odor.
 erect, fls. yellow.

fl. white.

21312

4 23

Rubi.

Rubi.

wet ground along river

1 24

Lepanura

side of ravine above stream

A. J. Bell
 947-10-10
 cin. 1041
 gen. 1041
 1041 04

1 25

Psychotria

side of ravine

4 26

Cephaelis

1 27

~~Boucardia~~

Diodia octarifolia (Willd.) Brea.

side of trail

1 28

Panicum

~~shrub~~

10

Oct. 13 - 2

rather scrubby

woods, cl.

1 29

Panicum

wet seep -

1 30

Jussiaea

thicket of

1 31

common

1 32

Polygala

wet banks along road

1 33

Utricularia

wet places along road

1 34

rare

moist bank.

shrub 4 m. tall, fls. bluish

suffrutescent herb up to

0.8 dm. tall, fls. white.

very fragrant.

slender shrub,

sparsely branched,

slightly aromatic

brittle herb, fls. whitish.

small tree 5 m. tall,

bracts purple, fruit

blue, fleshy.

fls. white.

shrub 4 m. tall,

infl. coral red, fls. yellow.

prostrate

petals white

leaves dark green, fls.

white, roots with wintergreen

erect, fls. yellow.

fl. white.

21222

Rubi

4 23

Rubi

wet ground along creek

1 24

Liparuna

side of ravine above stream

Gal. Bell's
 9 + 10 m. alt.
 C. 10.4
 9.5 m. alt.
 10.4

Psychotria

side of ravine

4 26

Cephaelis

1 27

Browia

Diodia octimifolia (Willd.) Bren.

side of trail

1 28

Palicourea

~~shrub 4 m.~~

50

Oct. 13 - 2 m. alt. - 100 m.

rather scrubby, bushy wet
 woods, clay soil.

1 29

Panicum

wet seep in old quarry

2 30

Jussiaea

trickle of water in old quarry

3 31

common in open wet places

2 32

Polygala

wet banks along road

1 33

Utricularia

wet places along road

1 34

rare

moist banks

shrub 4 m. tall, fls. bluish.
 suffrutescent herb up to
 0.8 dm. tall, fls. white,
 very fragrant.

slender shrub,
 sparsely branched,
 slightly aromatic.
 bottle herb, fls. whitish.

small tree 5 m. tall,
 bracts purple, fruit
 blue, fleshy.
 fls. white.

shrub 4 m. tall,
 infl. coral red, fls. yellow.

prostrate

petals white

leaves dark green, fls.
 white, roots with wintergreen odor.
 erect, fls. yellow.

fl. white.

21235

Rubi

3

Thickets on roadside

36

Rubi

along trail

37

common in second growth

38

Rubi

in opening

39

Rubi

common in woods

40

Psychotria

dense shade

41

Lycopodium

in openings

42

common everywhere in wet open places.

43

Rubi

common in shade along trails

44

Rubi

shaded wet places

45

Blechnum

common

46

Hedyosmum

common

47

Rubi

wet banks along road

herbaceous vine, fls. white, fruit red-purple, fleshy.

- weak herb, 1-2 m. long, fls. purple.

- small tree 6 m. tall, fls. white, fruit immature vine

busby tree, fls. white, ripe fruits dark blue, ripening at different times in same cluster, fls. whitish, rhizome brittle, fleshy, short erect, infl. on erect peduncle. scrambling

prostrate, fls. yellow.

fl. ^{dull} greenish white.

branch forming a liana several to many m. long, faintly aromatic. - small tree, 6 m. tall. - aromatic herb, stems sharply quadrangular, fls. blue-violet.

✓ Oct. 14 - 1 km. n. of Junin,

wet forest

Narino
about 2000 m.

L 21248
70

Ladenbergia aff. *perfoliata*

✓ Oct. 15 - slope above Laguna de la Cocha, on road to lasto, just east of the summit, Putumayo sub-paramo brush, 3200 m. much *Chusquea* sp.

L 49 *Centropogon ferrugineus*

L 50 *Nertera tetrasperma* HBK.
banks and open ground by road, abundant

L 51 *Boraginaceae*
open flat ground by road, common

Oct. 15 - Encano, Laguna de la Cocha, Putumayo 2800 m. steep slopes above village, soil with deep duff layer and much humus in or thick (0.4 m.) layer beneath, cleared for potatoes, ullucos, etc. *Linchona* ^{*pitagueris*} was once common here. The stumps are common and all have clumps of sprouts. Many

tree 10 m. tall, 20 cm. thick, fruits pendent.

weak shrub, fls. deep orange, column white, anthers blackish.

prostrate, leaves stiff, fls. yellowish, fruits fleshy, dark red when ripe, skin tough, pyrenes 4.

prostrate, fls. white.

of the stumps have been peeled to the ground but the leaves are still green. Probably the roots will eventually starve. Almost all are heavily infested and damaged by a caterpillar.

Mozures Ridge, 10 km.

✓ Oct. 16 - Chacapamba,
n.w. of Pasto, near highway to Popayan
Nariño 2800 m.

- L 21252 *Cinchona pitayensis*
cleared slope, common
L 53 *Cinchona pitayensis*
forest on south slope

✓ Oct. 16 - Hills s.w. of Chachaguri,
n. w. of Pasto, Nariño.
second growth woods, 2100 m.

- L 54 *Sarauja*
L 55 *Cinchona pubescens* Vahl

- L 56 *Guettarda*
L 57 *...*

- L 58 *M...*

- Anal. Bellis
from branches
Q+C n.m. tr
cin 0.3
qui n.m. tr
CC.H 0.3
from trunk
Q+C n.m. tr
cin 2.2
qui n.m. tr
T.C.H. 2.2.
L 59 *Cinchona pubescens* Vahl
steep slope

✓ Oct. 19 - La Cruz, Nariño 4300 m.
cultivated in plaza.

- L 2 60 *Populus*
~~sterile, branches very erect~~
L 61 *Podocarpus*

stump sprouts, growing
vigorously in cleared land.
tree, fruit immature.

Anal. Bellis
Q+C n.m. tr
cin 0.4
qui n.m. tr
CC.H. 0.4

- shrub 2.5 m. tall, fls. white.
slender stump, sprout
4 m. tall. veins of leaves
reddish. (bark sample)
sterile shrub 3 m. tall.
slender shrub, fruit
immature.
vine climbing in trees
fls. greenish, fruit red.
tree 6 m. tall, branched
at base into 3 trunks
about 15 cm. thick, leaves
with red veins (bark sample)

shrub, sterile, branches erect
(lost for rest)
small tree, said to have
been brought from nearby
forests.

✓✓ Oct. 19 - La Cruz, Narino, 2300 m.
along weedy trail ~~in~~ in low
second-growth brush on
top of dry ridge of volcanic ash
Hedyotis
shaded dry banks

21262

63

L 64

Scroph.

L 65

Vaccinium

L 66

Nytholaea

dry vertical earth bank.

L 67

Pellaea

dry vertical earth bank

L 68

Cheilanthes

dry vertical earth bank

L 69

Pellaea ternifolia

dry vertical earth bank

L 70

Blechnum

✓ Oct. 20 - ridge between
Rio Tajumbina and quebrada
del Salado, 5 km. e. of Volcan
Doña Juana.

Narino, 3000 m.

wet ridge, upper part wooded,
lower cleared in pasture,
with bushy fence-rows.

21270 a Asplenium
dry vertical earth bank

shrub 3-4 dm. tall, fls.
white, pinkish outside.
low spreading shrub,
fls. vermillion without,
orange within, column coral,
anthers tan.

suffrutescent herb up
to 1 m. tall, fls. magenta.
leaves 4-ranked.

spreading shrub up to
1 m. tall, fls. deep coral
red with green tips,
bracts pinkish green.

Cinchona pitayensis
is occasional here, mostly
saplings, as all larger
trees have been cut for
bark. Over a ton of wet
bark has been taken out
in tiny lots since Sept. 6.
Most of plants show a trace
of pubescence on petioles, veins, etc.

- 212702 *Fuchsia*
brushy fence-row in pasture.
- 71 *Palicourea*
common in brushy fence-rows in pasture.
- 72 *Calceolaria lehmanniana* Kränzl.
along trail in forest
- 73 *Cinchona pitayensis*
steep e. slope
- 74 *Comb.*
level ridge top.
- 75 *Comb.*
on log in forest
- 76 *Palicourea*
common in forest.
- 77 *Comb.*
on log in forest.
- 78 *Cinchona pitayensis*
dense forest on steep east slope, deep humus.
- 79 *Cinchona pitayensis*
dense forest, steep east slope
- 80 *Cinchona pitayensis*
dense forest, steep east slope, deep humus.

- shrub 2.5 m. tall,
infl. drooping, hypanth.
rose-color, sepals reddish-
green, petals bright crimson.
- shrub 3-4 m. tall,
fls. dark purple outside,
pale lavender within,
fruit immature. infl. yellow.
- fl. white, sometimes
with purplish tinge.
- sapling 3 m. tall,
leaves with conspicuous
pits in axils of ~~leaves~~ veins.
- herb up to 1 m. tall,
buds orange, corolla
pale cream-yellow, funnel-
form, infl. drooping
somewhat, fruit immature.
- sepals ^{petals} maroon-purple,
lip white.
- shrub 2 m. tall, infl.
blue-green, ripe fruit
dark blue.
- fls. whitish.
- sapling 4 m. tall, sterile,
trunk 5 cm. thick (bark sample)
(bark sample) (bark peels easily)
- sapling 2 m. tall
- sterile sapling 6 m.
tall, 6 cm. thick (bark
sample, peels easily)

det Molau
1978

Anal Bellis
f+c 1.7
cin 2.4
gum 0.5
T.C.H. 4.6

Anal Bellis
f+c 2.1
cin 2.1
gum 0.4
T.C.H. 4.6

Oct. 21 -

2 km. above San Bernardo,

Nariño 2200 m.

- 81 *Cinchona pubescens* Vahl
edge of ravine above stream
in flat valley bottom, gravelly
soil.

Anal Bellis
g+c n.m. to
cin 1.2
quin n.m. to
T.C.P. 1.2

Oct. 21 - ^{steep} side of valley of
Rio Quina, across from
San José, Nariño 2000 m.

- 82 *Cinchona pubescens* Vahl
steep cleared slope, thickets
of second growth.

Anal Bellis
g+c n.m. to
cin 2.6
quin n.m. to
T.C.P. 2.6

Oct. 21 - 6 km. e. of La Unión
on road bet. La Unión and
Cartago, Nariño 2030 m.

- 83 *Cinchona pubescens* Vahl
roadside on steep slope
in open.

Anal Bellis
g+c 0.4
cin 1.7
T.C.P. 2.1

Oct. 22 - 5 km. s. of Timbri

Cauca

7 thickets along ravine,

1850 m.

second growth

- 84 *Cinchona pubescens* Vahl

Anal Bellis
g+c n.m. to
cin 0.6
quin n.m. to
T.C.P. 0.6

Oct. 23 - 6 km. n. of Popayán,
Cauca

pasture with scrub growth along ravine, 1850 m.

- 85 *Cinchona pubescens* Vahl
common in small second
growth along road near stream

C. pubescens occasional in thickets
+ along ravine banks in valley bottom.

15 cm. thick,

tree 6 m. tall, leaf veins
reddish, (bark sample);
tree injured both by bore
and by chrysomelids.

C. pubescens occasional, but
most of region cleared. ^{occurs alt.} 6400 - 7400 ft.
tree 8 m. tall, 15 cm. thick,
fls. fragrant, coral red
outside, pale pink inside.
(bark sample)

C. pubescens common in patches
of second growth + along roadside.

tree 10 m. tall, 20 cm. thick,
sterile. (bark sample)

Cinchona pubescens common,
good sized trees, up to 15 m.

tree 7 m. tall, 12 cm. thick,
old leaves red (bark sample)

sapling 4 m. tall, fls. pink,
fragrant.

- Oct. 26 - Rio Santo Domingo, 12 km. e. of Tacueyo, w. slopes of Nevado del Huila, 21 km. s.e. of Corinto, Cauca rain forest on steep slope
- 21286 *Cinchona pubescens* Vahl

- 87 *Cinchona pitayensis*
frable gray-brown soil
with thick druff layer

88

89

- 90 *Galium*
on log
partially cleared rain forest

91

Oct. 27 same loc.

- 92 *Cinchona pubescens* Vahl.
steep slope on wall of canyon

- 93 *Cinchona pitayensis*
steep slope on wall of canyon

- 94 *Pilea*
95 *Uncinia*
canyon wall

Hymenophyllaceae and tree ferns surprisingly scarce.

2800 m.
Anal Bellis
q+c 0.4
cin 2.2
T.C.A 2.6

2960 m.
Anal Bellis
q+c 2.0
cin 2.3
T.C.A 5.0

2800 m.
2900 m.

2700 m.

2800 m.

Anal Bellis
q+c 1.6
cin 1.1
T.C.A 2.7

Anal Bellis
q+c 1.9
cin 0.6
quin 0.8
T.C.A 6.3

tree 15 m. tall, 3 dm. thick
leaves green, fruit
mostly immature
(bark sample)

small sterile sapling,
5 m. tall, 6 cm. thick
(bark sample)

fls. white
fls. white, fragrant

roots orange, plant
prostrate
forming loose tangles
slender shrub, 4 m. tall,
fruit green.

tree 15 m. tall, 3 dm. thick,
fls. pink, fragrant
(bark sample)

tree 10 m. tall, 1.5 dm. thick,
fls. purple, green fruits
much larger than dry ones
(Davis says there is a flower blight)
(bark sample)

erect herb 1 m. tall
trifoliate

21296 *Botrychium virginianum*
"vegeta" or bushy along river, rare.

97 *Lepidoptera*
steep slope

98 *Psychotria*
near stream, along trail

Oct. 27 - same loc. 10-11 km. S. Tacueyo
cleared part of valley
young second growth

99 *Galium hypocarpium*

21300 *Daucus*

01 *Drymaria*

02 *Lupinus*

03 *Myrica*

04 *Gonzalagunia*
scattered in pasture, valley bottom

05 *Calceol*

06 *Fuchsia*

07 *Liparura*

Oct. 28 - Rio Palo bet. El Palo
and Tacueyo.

Cauca 1500 m.

08 *Tephrosia toxicaria*
common on brushy cleared steep
slope.

tree 10 m. tall, 10 cm. thick,
corolla green.
herb 1 m. tall, fls.
greenish white

vine-like, fruit orange, fleshy,
"cicuta", said to be very poisonous.
prostrate to ascending,
plant grayish, fls. white
herb, 1 m. tall, fruits
fleshy, white.
shrub 3 m. tall, almost
odorless.
bush 2.5 m. tall, fls.
whitish, fruit gray, fleshy.
shrub 2 m. tall, fls.
yellowish green.
shrub 2.5 m. tall, fls.
scarlet.
shrub 2.5 m. tall, fls.
yellow, fruit rose-pink,
plant unpleasantly
aromatic.

erect herb, up to 1 m. tall,
roots thick, woody, fls. cream-white,
variable to reddish. (root sample)

Oct. 29 - Palmira, El Valle
grounds of experiment
station, cacao plots. 925 m

21309 *Theobroma cacao* L.

4 10 *Theobroma bicolor* H. & B.
(said to have been brought
from the Chocó.)

The two above species may
be distinguished by the
T. cacao

| | |
|------------|---|
| habit | spreading |
| leaves | oblong, green on both sides, |
| infl. | scarcely palmately veined at base |
| fls. color | so reduced as to be fasciculate, on old wood. |
| petals | cream |
| | 3 mm. long, with yellow terminal appendage 6-7 mm. long, strongly clawed |
| stamen | 3 mm. long |
| staminodes | 9 mm. long, linear-auriculate, erect |
| pistil | 4 mm. long, green red-papillate |
| fruit | glabrous, ^{dully glossy} broad-fusiform, pointed ridges rugose, furrows smooth |

5 11 *Paratrich*
parasitic on *Theobroma cacao*

tree, low and spreading,
leaves hanging vertically,
green on both sides, fls.
cream color with maroon
staminodes.

tall, erect tree, leaves hanging
vertically, almost white
beneath, fls. dark red
with maroon staminodes,
fruit oblong, green, with
the furrows strongly
rugose.

following contrast:

| | |
|---|---|
| <i>T. cacao</i> | <i>T. bicolor</i> |
| erect | erect |
| ovate-cordate, white | ovate-cordate, white |
| beneath, strongly palmately veined. | beneath, strongly palmately veined. |
| open, axillary, in leaf axils. | open, axillary, in leaf axils. |
| dark red | dark red |
| 2 mm. long with maroon terminal | 2 mm. long with maroon terminal |
| appendage 1 mm. more long, | appendage 1 mm. more long, |
| this almost sessile. | this almost sessile. |
| 2 mm. long | 2 mm. long |
| 5 mm. long, oblanceolate-acute, | 5 mm. long, oblanceolate-acute, |
| somewhat spreading. | somewhat spreading. |
| 2.5 mm. long, minutely white-papillate | 2.5 mm. long, minutely white-papillate |
| papillate appearing velvety, oblong, | papillate appearing velvety, oblong, |
| bluntly slightly retuse, ridges smooth, | bluntly slightly retuse, ridges smooth, |
| furrows deeply longitudinally rugose. | furrows deeply longitudinally rugose. |
| sub-scandent, lvs. green. | sub-scandent, lvs. green. |
| fls. dull orange, fruit immature. | fls. dull orange, fruit immature. |
| "mata palo" serious pest. | "mata palo" serious pest. |

✓ Oct. 31 - 5 km. s. of Bugalagrande,
El Valle 900 m.
flat valley floor, thickets
in low places.

L 71312 *Hamelia*

✓ Oct. 31 - 5 km. n. e. of Filandia,
on highway from Pereira to
Armenia, El Valle Caldas 2050 m.
second growth thickets on
steep slope

L 13 *Cinchona pubescens* Vahl

L 7 14 *Guettarda*

L 15 *Lycopodium*
grassy roadside bank

L 16 *Polygala*
grassy roadside bank
~~*Polygala*~~

✓ Oct. 31 - just n. e. of Circasia
w. of Salento, on road
from Pereira to Armenia, El Valle
Caldas 1900 m.

L 17 *Cinchona pubescens* Vahl
shade tree in coffee plantation

L 18 *Conium*
parasitic on *Cinchona pubescens*

L 19 *Cinchona pubescens*
second growth thickets.

sub
light orange.

shoots

fls.
black,
e.

with

patches
of plants
common,
a good sized tree.
trunked
in pink,
ample

young green, fruit white.

slender, tree 8 m. tall

✓ Oct. 31 - 5 km. s. of Bugalagrande,
El Valle 900 m.
flat - alt. 800 m.

L 21312
4

Broodbeck

11 PB #1 = 759

#2 = 760

#3 = 761

L 13

L 7 14

L 1 15

L 16

✓

Rodriguez 30A
(Accessed) 819

L 17

L 18

L 19

parasitic on *Cinchona pubescens*
Cinchona pubescens
second growth thickets

little slender shrub
3 m. tall, fls. light orange.

clump of sterile shoots
5 m. tall.

shrub 5 m. tall, fls.
white, ripe fruit black,
mostly not ripe.

fls. purple, root with
wintergreen odor.

hilly country with patches
of second growth and coffee planta-
tions, *C. pubescens* very common,
mostly shoots, but some good sized trees.

Tree 12 m. tall, half strangled
by a ~~tree~~ *Ficus*, fls. pink,
fragrant. (bark sample)
plant green, fruit white.

slender tree 3 m. tall

Anal. Notes
21312 22
C1 11
21312 11
TCH 1-6

✓ Oct. 31 - 5 km. s. of Bugalagrande,
El Valle 900 m.
flat valley floor, thickets
in low places.

L 1312 Hamelia

✓ Oct. 31 - 5 km. n. e. of Filandia,
on highway from Pereira to
Armenia, El Valle Caldas 2050 m.
second growth thickets on
steep slope

L 13 Cinchona pubescens Vahl

L 7 14 Guettarda

L 1 15 Lycopodium

grassy roadside bank

L 16 Polygala

grassy roadside bank

~~Guettarda~~

✓ Oct. 31 - just n. e. of Circasia
w. of Salento, on road
from Pereira to Armenia, El Valle
Caldas 1900 m.

L 17 Cinchona pubescens Vahl
shade tree in coffee plantation

L 18 Lycopodium

parasitic on Cinchona pubescens

L 19 Cinchona pubescens
second growth thickets.

little slender shrub
3 m. tall, fls. bright orange.

clump of sterile shrubs
5 m. tall.

shrub 5 m. tall, fls.
white, ripe fruit black,
mostly not ripe.

fls. purple, root with
wintergreen odor.

hilly country with patches
of second growth and coffee planta-
tions, C. pubescens very common,
mostly sprouts, but some good sized trees.

Anal. Nelson
Ht. 2 7.5
Ci 1.0
Dm 1.0
TCA 1.0

Tree 10 m. tall, half strangled
by a ~~fig~~ fig tree, fls. pink,
fragrant. bark sample
plant green, fruit white.

slender tree 8 m. tall

Nov. La Aguadita

Cundinamarca

Wooded ravine in pasture
 21 3 20 *Anguria*
 edge of second growth
 woods

4 21 *Cinchona officinalis*
 steep side of ravine

5 22 *Palicourea*
 shade on side of ravine

2 23 *Psychotria*
 shade on side of ravine

Nov. 5 - Canyon of Quebrada ^{aguardiente} ~~Quebrada~~
 below San Miguel, road
 from Bogota to Fusagasuga

Cundinamarca

all of canyon, wet forest
 1 24 *Cinchona officinalis* L.
 steep slope

4 25 *Oreocarya*
 epiphytic on leaning tree trunks

7 26 *Cinchona officinalis* L.
 steep slope, occasional

clump of slender shoots
 about 6 m. tall, stems
 brittle, fruits immature

herb up to 1 m. tall,
 fruits ^{pale} purplish, infl.
 purple.
 erect herb, 1 m. tall, fruit
 white

Cinchona officinalis scattered
 through the forest, mostly
 small trees, being
 harvested.

sterile tree 5 m. tall, 1 dm.
 thick, leaves glossy, larger
 than usual.

spreading herb up to
 1 m. long, fls. bright
 crimson

tree 6 m. tall, 9 cm thick,
 fruits immature, all trees
 seen in fruit have the
 large spreading calyx
 that this has.

Nov. 9 - Agua Bonita, above
La Aguadita, on road bet.
Bogotá + Fusagasugá, Cundinamarca
grazed clearing
21327 *Ladenbergia undata*

Nov. 16 - 5 km. s. of Pandi, 7 km.
s.e. Tenongo, ~~Tolima~~ w. & s. of Rio
Lumapay, Tolima

28 coffee plantation

29 *Coariburena*
rocky bluff

Nov. 17 - Aurora, 12 km. e.s.e. of
Cunday, upper Rio Vichia, Mun. de
Cunday, Tolima 1500 m.

30 *Ladenbergia magnifolia*
wooded ravine, abundant

Nov. 17 - La Colonia Agrícola,
11 km. e. of Andalucía, w. slope
of Cordillera de Altamira, Mun.
de Cunday, Tolima 2000 m.

31 *Elaeagia utilis*
recently cleared pasture
formerly wet forest.

small bushy tree 4 m.
tall, leaves quite
polymorphic.

1610 m. - scandent shrub, fls.

1910 m. - pink
sterile sapling 3 m. tall,
leaves glossy.

tree 25 cm. thick, 10 m. tall,
others much taller.

tree 6 m. tall, old leaves
red, fruits terminal on
dead twigs. (other trees
seen several times as
tall) buds in thick
gum.

Nov. 13 - Headwaters of Rio Guindao, 8 km. n.e. of La Colonia Agrícola, 13 km. e. of Andalusia, w. slope of Cordillera de Altamira.

32 *Cinchona pubescens* Vahl
sparse second growth in pasture, wet forest

73 *Nertera granadensis*
very abundant on logs and ground in recently cleared land.

34 *Cinchona officinalis*
common in ^{second} second-growth wet forest on more or less flat-topped ridge, deep duff layer

35 *Palicourea*
fence row in pasture cleared in wet forest

36 *Centropogon*
thickets in second-growth ~~in~~ rain forest.

C. officinalis is common locally on the benches and slopes of the Cord. Altamira, but is rapidly being cleared out. I saw one on that in to Aguadito.

2000 m. Tree 3 m. tall, really two sprouts out of an old stump, ^{which} had been removed up to about 2 m. but had grown back to form a thin layer leaves purplish red beneath, especially the veins, old leaves red.

"guina roya"
prostrate, forming a mat, fruit red, fleshy, fls. greenish.

2100 m. stump sprout 9 m. tall, 5 cm. thick, old leaves red, veins more or less reddish, leaves more or less dull above. (all plants seen were sprouts) (both samples)

2150 m. small tree 6 m. tall, infl. yellow, fls. pale yellow, fruit blue-black. ~~shrub~~ ^{shrub} fls. deep orange, column white, anthers blackish, ~~fruit~~ ^{fruit} subglobose.

✓ Nov. 18 - w. slope of Cordillera
~~Cordillera~~ de Altamiral,
 bet. headwaters of Rio Cuindo
 Fes and Rio Cuindo Blancos, 12
 km. e. of Andaluca, Munde
 Cunday, Tolima 2150 m.
 second growth thickets, rain forest

L 21337

Palicourea

L 4 38 Palicourea

L 1 39 Cephaelis

L 2 40 ⁹² Lobelia

✓ Nov. 18 - ridge bet. Rio
 Cuindo Blancos and Rio Cuindo
 Fes, 9 km. e. of Andaluca,
 Munde Cunday, Tolima 2150 m.
 flat topped ridge, wet second
 growth.

L 4 41 Lobelia

slender shrub 5 m. tall,
 infl. reddish-flesh-purple.
 fls. purplish pink,
 fruit immature, fruiting
 infl. drooping.

shrub 2 m. tall, infl.
 coral red, fls. bright purple.

shrub 1 m. tall, infl.
 bright purple, fruit
 fleshy, pale dull lavender.
 erect herb, fls. ~~scarlet~~
~~red~~, scarlet, anthers ^{dull} tan

spreading herb up to 2.5 m.
 long, corolla scarlet, with
 lobes yellow, column
 yellow, anthers with
 connective red, sacs
 brownish

Nov. 13

Quining in region bet. Rio Lurmapay and drainage of Rio Lunday - down around 6500 ft. *C. pubescens* occurs where any second growth is left, though most of this is cultivated or in pasture. Apparently formerly there was a belt bet. 7500 ft. and 8100 ft. or more where *C. officinalis* occurred locally, mostly in "manchas". This area is larger than might be expected because of the prominent plateaus and benches in the topography. Now most of this has been harvested, excepting in the most inaccessible places, and the quineros are going back after the sprouts that they left the first time. The form found here is the same as that found as far northeast as La Guatadita and Aguas Verdes above Fusagasuga.

Other places suggested for exploration -

In talking with the quineros in the western Lurmapay region, there were mentioned as places as yet unexploited the southern Cordillera de Altamiral, from La Colonia south toward Dolores - said to be inaccessible from lack of trails. The headwaters of the Rio Riachon were mentioned and the region of Santa Ana, Huila, east of the Cordillera Gigante. The headwaters of the Rio Duda are being much talked of. A piece of *C. officinalis* bark was shown me from there in August by the Inspector of Police, Sr. Mejia, in La Concepcion. One of Robertson's men has been about 2 days down from the headwaters of the Duda and brought back *C. pubescens*, with reports of enormous quantities.

Nov. 21 - Hills west of Laguna Quatavita

sub-paramo brush, *Condunamarca*
gentle slope 2900-3000 m.

21342
Castilleja
thicket, common

L 43 *Stevia*
common along trail

L 44 *Stevia*
occasional along trail

L 45
rare along trail

L 46 *Salvia*
common in patches

L 47 *Cestrum*
occasional

L 48 ~~Befaria~~ *Befaria*
occasional

L 49 *Gentiana*
in open places

Weak shrub 1.5 m. tall,
upper bracts and calyces
red in distal two thirds,
corolla green above, yellow
beneath

~~some~~ sticky, suffrutescent
herb, 1 m. tall, fls. whitish.

turning pink.
very sticky, suffrutescent
herb, 1 m. tall, fls. reddish
with conspicuous white
styles.

decumbent herb, 1 m. long,
ascending distally, fls.
white.

ranks growing bushy
herb, 1 m. tall, leaves very
rigid, calyces blue-black,
corollas blue.

shrub 1.5 m. tall, fls.
greenish white, lobes
darker.

shrub 1.5 m. tall, fls.
rose-pink, not sticky,
leaves white beneath
fls. pale purple with
dark markings especially
toward base

- 21350 *apium*
openings occasional
- L 5 51 *Epipactis*
common in openings and
rocky places
- L 4 52 *Hedyotis*
common in open places
- L 2 53 *Pachyanthus*
common in open places
- L 3 54 *Bacopa*
in thickets on top of hill
- L 1 55 *Miconia ligustrifolia*
common
- L 2 56 *Gnaphalium*
occasional on rocky ledges
at top of hill

✓ Nov. 21 - shores of Laguna Guatavita

2900m.

grassy, weedy slopes, occasional
patches of brush, grazed

- L 1 57 *Daucus*
under small tree, steep slope
- L 1 58 *Cardamine*
under small tree
- L 5 59 *Weinmannia*
brush patch, rocky place
- L 4 60 *Elaphoglossum*
rock ledges

loose clumps, strong
~~celery~~ odor when
broken.
almost acaulescent
rosette, inflorescences
strictly erect, fls. yellow
erect shrub up to 0.3 m. tall.
leaves pale beneath.
rosettes bluish-green,
fls. white.
shrub up to 0.3 m. tall
fls. greenish yellow.
shrub 2-3 m. tall, compact,
~~fls.~~ fruits dull bluish-green.
white.
erect, heads brownish
white

fls. white

shrub 2.5 m. tall, fls.
whitish, fragrant but
not pleasantly so

- 21361 *Baccharis*
 occasional along ravine
 62 *Juncus bufonius*
 grassy place
 63 *Mutisia*
 climbing in brush
 64 *Calceolium*
 common
 65 *Alchemilla*
 common among grass
 66 *Carex*
 common in edge of water
 67 *Alchemilla*
 common among grass
 68 *Galium*
 rare among grass
 69 *Drymaria*
 one plant in large crevice
 under rock.

Nov. 22 - Choachi.

Cundinamarca

weedy cultivated field

1750 m

- 70 *C. sp.*
 71
 72 *Borreria*
 73 *Centaurium*
 74 *Ambrosia*
 most abundant plant in field
 75 *Euphorbia*
 76 *Melastoma*

shrub 1 m. tall.

heads pendent, rays
scarlet.

erect herb up to 1.5 m. tall
upper stems + involucres
maroon purple, rays deep
brilliant purple, disk
dull reddish yellow.
decumbent to erect

small clumps.

decumbent to erect

prostrate from thick root

fls. white
oily odor when broken

fls. pinkish
perennial

small spreading tree,
fls. white.

21376 *Polygonum*

Nov. 23 - 3 km. e. of Choachi,
along Quebrada Salitres,
Aldea de Choachi, Cundinamarca
second growth woods. 2300 - 2550 m.

L. 77 *Liphocampylus*
second growth brush

L. 78 *Duranta*

L. 79 *Palicourea*
rather open forest

fls. white

Completely denuded up to
about 2400 m., some brushy
second growth below that.
C. pubescens has been
abundant here, but a
large part has been
harvested. At about
2550 m. *C. officinalis* of a
peculiar type starts.
It is localized in manchas.
Vargas and Brodbeck say
that harvesting of *C. officinalis*
has scarcely begun
here, and that there should
be production for a year.
The forests extend, at these
altitudes, north to Mundo
Nuevo.

2300 m. scrambling branched
shrub, corolla bright
crimson red, column white,
anthers blackish.

2700 m. spiny shrub 3 m. tall,
leaves glossy & somewhat
rugose above, dull & paler
beneath, fls. white.

2550 m. shrub 2 m. tall, branches
weak, fls. and inflorescence
purple.

- 21330 *Cinchona officinalis* L.
rather open forest on steep southeast slope, several trees here in a group or "mancha".

Bark sample taken, checker-boarded ~~roughly~~ into 3 equal samples, for a drying experiment. One part is to be dried in sun, one in shade, and one rotted.

- 81 *Cinchona pubescens*
lower edge of forest, rather mature second growth, quite common but mostly harvested already.

- 87 *Galium*
lower edge of forest

Anal. Bellis

| Dried in shade | |
|----------------|-----|
| q+c | 2.8 |
| (q+c) | 1.7 |
| cin | 1.5 |
| quin | 4.0 |
| T.C.A. | 4.0 |

Dried in sun

| | |
|--------|-----|
| q+c | 2.7 |
| (q+c) | 1.9 |
| cin | 1.3 |
| quin | 4.0 |
| T.C.A. | 4.0 |

Rotted

| | |
|--------|-----|
| q+c | 3.1 |
| (q+c) | 1.6 |
| cin | 1.1 |
| quin | 4.0 |
| T.C.A. | 3.2 |

2401 m.

Anal. Bellis

| Sample dried in sun | |
|---------------------|------|
| q+c | 0.61 |
| cin | 1.23 |
| quin | 1.84 |
| T.C.A. | 1.84 |

Sample dried in shade

| | |
|--------|------|
| q+c | 0.86 |
| cin | 1.39 |
| quin | 1.84 |
| T.C.A. | 1.85 |

2401 m.

tree 20 cm thick, 15 m. tall, leaves glossy above, with reddish veins, margins tending to be revolute, stipules reddish & green, erect, rather caespitose angled, fls. deep purple with white hair, tending to be ascending in the cluster, fruits thick, slightly compressed. (This plant in many ways approaches *C. pitayensis*, especially in the shape of the fruit, though the latter is not strongly ribbed. The small stipules are not like those of *C. pitayensis* nor *officinalis*, but more resemble those of some forms of *C. pubescens*). "quina roja" tree 15 cm. thick, 17 m. tall, veins of leaves reddish, stipules green, erect, becoming strongly revolute, "quina roja" bark sample checker-boarded into 4 equal parts, one to be dried in sun, the other in shade, roots yellowish, plant low, spreading but not prostrate.

Nov. 24 - Crest of Cerro de
Forte, district of Ferrolarada
10 km. n.e. of Choachi, Prov.
de Choachi, Cundinamarca
moist woods. 7600 m

- 21353 *Ladenbergia undata*
common on e. slope

24

rare in shade, terrestrial

- 85 *Cinchona officinalis* L.
scattered in woods on
e. slope.

- 86 *Symbolanthus*
common in ridge-top bushy
forest.

- 87 *Cinchona officinalis* L.
scattered in woods on e. slope

Nov. 25 - Choachi

Cundinamarca

1770 m

- 88 *Salix*
in yard, abundant in region

tree 20 cm. thick 15 m. tall,
others much larger
seen. "aguana"
erect, fls. greenish

slender tree, 10 cm. thick
12 m. tall, sterile,

shrub 2 m. tall, fls.
rose-pink, with 3 white
stripes on each corolla lobe.
tree 10 cm. thick, 10 m. tall,
bark being harvested.

tree with weeping habit.

Dec. 5 - n. slope of Peña Blanca,
8 km. e. of El Colegio, 35 km.
w. of Bogotá, Cundinamarca
2000-2100 m.
wet forest with many epiphytes

with
F. J. Hermann

71389

Cinchona pubescens Vahl
along stream common locally.

3 90

Hydrocotyle
rocks along stream

3 91

Psychotria
undergrowth on steep slope

11 92

Cinchona officinalis L.
steep slopes, common.

slopes above 1900 m. well
wooded. a considerable stand
of *C. pubescens* at about
2000 m. in the bottoms of
gullies, the trees all
more or less diseased.
Above this, on a slope
is considerable *C. officinalis*
of the usual large old
var. from this region.
Trees up to 25 cm. in diam.
& many smaller, but
no seedlings. Collected
bark sample of each
with herb. sp. & ~~several~~
several without, these
under *Valeriana* var.

2100 m.
Anal. Buller
g + e - 1.9
cin - 2.4
quin - 0.1
T.E.A. - 3.4

tree 40 cm in diam. 15 m.
tall. top dead, dead spots
in bark of trunk, loaded
with epiphytes, a few
leaves red. (bark sample)
(bark sample V-180 is bark sample
from similar tree nearby).
prostrate

2100 m.

2100 m.

Anal. Buller
g + e - 1.9
cin - 1.5
quin - 0.1
T.E.A. - 3.5

herb 1 m. tall, infl.
purple, fruit dull pale blue.
tree 20 cm. thick, 20 m. tall.
leaves green, very few red ones.
(bark sample) (others from other
trees under *Valeriana* var.
V-181, V-182)

- s.m. *Macrocnemum*
Near Rio Negro, Trail from Bolivar to
San Sebastian, Cauca.
- s.m. *Cinchona officinalis*
Reg. of Alto Cagueta, sent in
by correspondent from San Andres.
(~~not~~ exact origin not certain
anal. bellis)
- s.m. *Eleagia?*
above El Carmelo, near Santarosa,
Cauca
- 7 *Cassia*
near Los Milagros, road from
Bolivar to Los Milagros, Cauca
"galvis" tree 3 m. tall, 20 cm. thick.
- 8
Los Milagros, Cauca, Cord. Cent.
- 9 *Carya*
Los Milagros, Cauca, Cord. Cent.

- Palatani*, Cord. Cent., Cauca
- s.m. *Heteromela*
- s.m. *Liparuna*
- 251
fl. yellow-orange
- 252
vine
- 259 *Bomarea*
from fines of P. Jose Menadjed
tuber called "sachapapa"
- 260 *Bomarea*
"sachapapa"
- 261
La Cuchillo de El Letrero
- 270 *Ladenbergia*
fl. white
- with
R. Huntad Region of Cerro de San Pedro,
Cord. Occ., w. of Rio Patia, Cauca.
- 271 *Rondeletia*
at Casca de Abel Solante,
Diviso Chicaos
shrub with fl. rose-colored

273 *Passiflora*
El Boquerón, above Rio Guayas,
n. of San Pedro

274 *Passiflora*
El Boquerón

276 *Cinchona pitayensis*
El Boquerón

278 *Passiflora*
Los Pesitos, more central de
Los Cerillos, head of Rio Guacito
shrub 3-4 m. tall. fl. yellow,
infr. 1 m. long.

279 *Cinchona pitayensis*
n. side Cerro San Pedro, ~~but~~
trail from Boquerón to Argelia

283 *Passiflora*

288 *Condaminia corymbosa*

291 *Psychotria*
El Boquerón

292 *Rondeletia*
trail to San Alfonso from La Mesa
"haujón de los Andes"

293 *Cinchona*
Buenos Aires, garganta de la
Cordillera sobre San Alfonso

San Alfonso, Cord. Occ.
w. of Rio Patia
294 *Clematis*
"bejuco alcali"

295 *Condaminia corymbosa*
Rio Capitanes, trail
from Patia to San Alfonso

1944

Municipio de Santa Rosa,
upper Rio Cagueta, Cauca
500 *Cinchona officinalis*
above house of Canon J. Rivas,
Cordillera La Soledad
tree 10 m. tall, 30 cm. thick
"quina roja"

501 *Cinchona officinalis*
El Carmelo

502 *Cinchona officinalis*
above property of Juan J. Mendez,
to Remal de Cuchilla de
Quebradillas, El Carmelo
tree 5 m. tall, 5 cm. thick

503 *Cinchona officinalis*
same "quina terna"

504 *Cinchona officinalis*
same "quina terna"

505 *Cinchona officinalis*
same "quina terna"

192

1944 Colombia

J. G. Granger

- 506 *Cinchona officinalis*
above Casa de Felices Cruz,
Las Mesitas
"quino roja" tree 7 m. tall,
15 cm. thick.

1943 Colombia

193

J. G. Granger + C. Rodriguez

- ✓✓ Finca Las Mesitas
from near Silvia, 5370 m.
3 Cord. Central, Cauca.
1 *Calceolaria*
"boca dragon"
2 *Podocarpus*
"chaquiri" or "pino"
3
4 *Euphorbia pepelus* L.
5 *Oxalis*
"chilco"
6 *Galium*
"cicilla"
7
8 *Monnina*
9 *Burmeistera*
10 *...*
11 *...*
12 *...*
13 *...*
14 *Euphorbia pepelus* no. omitted
15 *Castilleja*

not over
100 ft.
high

194

1947

Columbus

Granger & Rodriguez

16

17 Fuchsia

18 Asplenium

19 Rubus

20 Miconia

195

1943 - Colombia

Collections made for me by others

~~Brookbeck #1~~*Cinchona pitayensis*

S.w. slopes of Nevado del
Huila above Tacueyo, bet.
Rio Santo Domingo & Quebrada
San Luis, drainage affluents
of Rio Palu, Cauca 2500-2800 m.

Brookbeck #1, #2, #3

Cinchona pitayensis

s. base of Volcan Doña Juana,
drainage of Rio
Tajumbina s.e. of La Cruz
(specimens brought in with
bark by a guinero)

Oct. 19, 1943

Cinchona pitayensis

~~base~~ above San Gerardo,
Rio Mayo drainage, n.e. of
La Cruz, Nariño

(specimens brought in by
guinero) Oct. 17, 1943

Cinchona pitayensis

slopes of Volcan Doña Juana,
s.e. of La Cruz, Nariño

(specimens brought in by
guinero) Oct. 19, 1943



